# amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

VOL. 46, No. 4 APRIL 1978

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### COVER PHOTO

Husband and wife team Earl Russell VK3BER and Mavis Russell VK3BIR proudly show us the works of their van when when working mobile/portable.

Mavis, licensed for 12 months, is Vice-President of the VK3 LARA group, and Earl, licensed 10 years approximately, was a member of the steering committee of the Frankston and Mornington Peninsula Amateur Radio Club (FAMPARC).

Both are active in clubs' affairs and their two children are also becoming involved in amateur radio.

Mavis and Earl are active on all bands.

Photograph by Reg Goudge.

# HAM RADIO SUPPLIERS

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**$18.90 — Postage $1.40**

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|---|---|
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WE STOCK CB GEAR AS WELL AT VERY COMPETITIVE PRICES, INCLUDING ANTENNAS AND ACCESSORIES.

**MODEL AS100 D/P MULTIMETER**

This meter features double zener diode meter protection and 3½" full view easy to read 2 colour scale. It is fitted with polarity reversing switch and housed in a strong moulded case with carrying handle.
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| 2 | 27.025 | 12 | 27.155 |
| 3 | 27.035 | 13 | 27.165 |
| 4 | 27.055 | 14 | 27.175 |
| 5 | 27.065 | 15 | 27.185 |
| 6 | 27.085 | 16 | 27.195 |
| 7 | 27.095 | 17 | 27.205 |
| 8 | 27.105 | 18 | 27.225 |
| 9 | 27.115 | 19 | 27.880 |
| 10 | 27.125 | 20 | 27.240 |

**$7.50 PAIR — Postage 25c**

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# amateur radio

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# QSP — THE INSTITUTE BUDGET

As another Federal Convention approaches, another budget is being prepared for the year 1979. As this matter is much too detailed for a QSP comment it is limited to the most significant items. On the expenditure side some 55 per cent of payments are made for the publication of Amateur Radio and 45 per cent for general running of the Institute. This was for 1977.

One problem to be faced in preparing the budget is that 1977 figures have to be used as a basis to prepare estimates for 1979. This requires considerable "crystal ball-gazing" as there is no way for an accurate assessment to be made, e.g. the cost of postage for the latter part of this year, leave alone next year. However the longer term trends do help and budgets properly prepared are very useful despite their lack of precision.

In view of the above ratio of payments, the number of copies of Amateur Radio produced is a very important figure, this is determined by looking at —

(1) The number of members who have renewed their subscription to mid-February as against the same time in previous years.

(2) The number of ARs printed for January as against previous Januarys.

(3) Such material as councillors can supply as to their division's efforts to increase membership.

The figures hereunder are supplied and examined for each division; VK totals are as follows:

| | Renewals to Mid-February | ARs Printed in January |
|---|---|---|
| 1976 | 3529 | 4497 |
| 1977 | 3653 | 4637 |
| 1978 | 4173 | 5249 |

From this material an estimate will be made of ARs to be produced as well as the number of members expected, hence the subscription income for the year as well as printing and distribution costs of AR. It is noted that 60 per cent of Amateur Radio expenditure was recovered from advertisers and direct subscriptions, and this resulted in an increase in the cost of AR to members rising from $12,931 in 1976 to $20,455 as shown in the audited accounts. The reasons for this are too lengthy to be gone into here, but will be discussed in detail at the Convention.

Every item of expenditure and revenue is looked at in detail and the need to incur it examined. The need for more expert and prompt attention to certain matters, as well as lack of volunteers, has resulted in more payment for services than we have had in the past. It is not possible for volunteers generally to meet deadlines that are now demanded, and it is not logical for paid personnel to wait for work to be completed in leisure time by voluntary labour. The attitude that one joins the Institute to get the best out of the hobby by playing amateur radio rather than doing administrative work, which can be done by others, is much more prevalent than in the past but the Institute still needs and would not exist without the many volunteers we have in the various committees and the actual running of the Institute. The budget now notes this, and provision is made within the limits allowed, for some assistance to get these people to get their jobs done.

K. V. ROGET VK3YQ, Federal Treasurer. ■

# QSP

### RECIPROCAL LICENSING

Brazil has reciprocal agreements with Bolivia, Canada, Chile, Colombia, Costa Rica, Denmark, Dominican Republic, Germany, Paraguay, Portugal, Sweden, United Kingdom, USA and Venezuela. IARU R2 News November 1977.

### USA THIRD PARTY AGREEMENTS

According to IARU Region 2 News of November 1977 the USA has third party agreements with Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Panama, Paraguay, Peru, Uruguay and Venezuela in South America; Costa Rica, Cuba, Dominican Republic, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua and Trinidad and Tobago; and with Canada, Israel, Jordan and Liberia.

### 160 METRE BAND IN SOUTH AFRICA

The 160 metre band has been opened up for greater use in South Africa. This was a result of approaches to the Postmaster General in South Africa by the South African Radio League. The report of the conditions of use was carried in the October edition of Radio ZS, the journal of the South African Radio League.

Amateurs have been allocated from 1.8 MHz to 2 MHz in South Africa, but most share the band with existing navigation services. This means that there are a number of spot frequencies with guard bands which must be avoided. These are 1.8 MHz, 1.807 MHz, 1.82 MHz, 1.83 MHz, 1.887 MHz, 1.936 MHz, 1.981 MHz and 1.982 MHz. The guard bands are in each case 3 kHz on each side of the spot frequency.

The power level allowed is 400 watts PEP.

### WARC 79

The editorial in QST Oct. '77 really ought to be compulsory reading for all amateurs, especially those who do not support the WIA by being members. Basically, this is what the editorial said — Gone are the days when the USA rules the roost at International Conferences because the 50 nations of 1947 has now grown to 153. A new majority, primarily of emergent nations encouraged by the communist countries, is ramming through resolutions. Issues are decided, not necessarily on their merits, but through a coalition of special interests. Frequently, these decisions are in defiance of positions strongly held by the USA but is conceivable that many small and poor nations at WARC 79 may construe USA support for amateur radio as just another symbol of the determination of the rich countries to dominate them through some sort of economic hegemony. Planetary resources (e.g. oil) are now recognised as finite in the same way that the radio spectrum is finite. Will amateurs use efficiently and with our high purposes all the frequencies we are demanding? But there are some positive factors. When scientists get together political factors tend to play a lesser role. The growth of the amateur radio community in Japan, Europe, Latin America and the Soviet bloc together with support from these countries is another factor. The work of the IARU intensively developing maximum support for the amateur cause is yet another factor. Our fate at WARC 79 can be improved by a reduction of tensions between nations, by assisting towards upgrading living conditions in poor countries and by conserving all the planet's precious resources.

### DISTURBING NEWS

Graham VK6ZGG, editor of the WA VHF Group News Bulletin, reports:—

(1) Approximately 200 Kyokuto 2 metre transceivers have been deliberately sold to non-amateurs in WA; and (2) that several legitimate Eastern State amateur call signs are being used on 2m and HF amateur frequencies without permission or knowledge of their legal holders; and (3) at least one E/S call sign is currently being used by a non-amateur with the full consent of the "rightful?" holder. Yes, this is all happening here in WA.

### USA ANTI-THEFT RADIO SIGNALS

"Interference on 160 and possibly the high end of 75m could result from the FCC's recent approval of wide-band swept anti-theft systems authorised in the bands 1.7 to 2.3, 4.05-4.95 and 7.4-9.0 MHz with a maximum field strength of 100 uV per m at 30m." Ham Radio October 1977.

### USA — CW

"CW sending test is being dropped by the FCC for all Commission administered amateur examinations, shortening and simplifying (since examiners won't need CW qualifications) the exam. Novice exams administered by volunteer examiners will still require a sending test, however, to weed out really bad fists." Ham Radio October 1977.

### GLASS-FIBRE

A note in Radio Communication of January 1978 deriving from LERC ARC Bulletin by W6DDB points out that the catalyst added to glass-fibre resin to accelerate hardening is usually mekp (methyl ethyl ketone peroxide) which can completely destroy eyesight. Once mekp commences to destroy eye tissue there is no known way to stop the process. When using glass-fibre resin and its additives protective glasses should be worn, together with ensuring an adequate supply of clean water on hand with which to wash out the eyes within seconds if an accident occurs. Mekp is also used in other products such as some liquid casting plastics.

### PACER

The Police district of Maroondah has recently been given the go ahead for the Police headquarters in Nunawading to form an organisation of CB Radio Operators to be known as PACER (Police Associated Citizens Emergency Radio).

This Organisation is currently gathering membership from **responsible** CB operators from within the Maroondah Police district, to be trained in many aspects of Police work, and to be available on call out by the Police Department.

Basically PACER will have several teams of twenty (20) members spread right throughout the Maroondah district covering an area from Nunawading to Healesville to Warburton, through the Dandenong Ranges back to Ferntree Gully and Wantirna.

These teams, once in operation, will, when required, be called out by the Police to assist in whatever situation that the Police feel that CBers can assist. This would include lost children, stolen cars and even crimes such as burglary and rape, etc.

Discipline will be one of the main aims and at the monthly meetings, which have already commenced, members are given lectures in virtually all facets of Police work. Some training exercises have already been carried out and there is a lot more to come which will not only make PACER into a successful organisation, but will give continuing interest to its members.

### COMPONENTS

From Ham Radio August 1977 editorial —

"As more and more amateurs switch to factory-made gear, and as industry uses more ICs and disposable plug-in modules, the life of the dyed-in-the-wool ham home brewer gets tougher and tougher. If you've recently tried any of the construction articles in the amateur magazines, you are already well acquainted with the hassle involved in obtaining a few needed components.

At one time you could drop in at your local corner radio store with a list of parts and the man behind the counter would fill your order. But that was when the vacuum tubes, resistors, and capacitors in your ham gear were the same as those in the family radio. It's not the same any more — now the transistors and ICs in the radios and television sets are designed specifically for that purpose and have operating characteristics that are of little use elsewhere. There are exceptions, but they are few and far between.

Another problem that faces the serious home builder is the tremendous variety of transistors and ICs available from different manufacturers. Although some types of devices are made by more than one company, in most cases the semi-conductor manufacturers crank out devices that are completely different from those of their competitors. And to add insult to injury, the same device may carry a dozen different part numbers: a 2N number, a replacement number, plus special numbers for units sold in large quantities to equipment manufacturers."

# WIRELESS INSTITUTE OF AUSTRALIA

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**Executive Office:** P.O. Box 150, Toorak, Vic., 3142. 2/517 Toorak Rd., Toorak, Ph. (03) 24 8652.

**Divisional information** (all broadcasts are on Sundays unless otherwise stated):

**ACT:**
President — Mr. E. W. Howell VK1TH
Secretary — Mr. Ted Radclyffe VK1TR
Broadcasts— 3570 kHz & 146.5 MHz: 10.00Z.

**NSW:**
President — Mr. T. I. Mills VK2ZTM
Secretary — Mr. I. A. Mackenzie VK2ZIM
Broadcasts— 1825, 3595, 7146 kHz, 28.5, 52.1, 52.525, 144.1, Ch. 8 and other relay stations: 01.00Z. (Also Sunday evenings 09.30Z and Hunter Branch, Mondays 09.30Z on 3570 kHz and ch. 3 and 6).

**VIC.:**
President — Mr. S. T. Clark VK3ASC
Secretary — Mr. J. A. Adcock VK3ACA
Broadcasts— 1825, 3600, 7135 kHz — also on 6m, 2m SSB and 2m Ch. 2 repeater: 00.30Z (Also on Radio 3HA).

**QLD.:**
President — Mr. D. T. Laurie VK4DT
Secretary — Mr. P. Brown VK4PJ.
Broadcasts— 1825, 3580, 7146, 14342 kHz: 09.00 EST.

**SA:**
President — Mr. C. J. Hurst VK5HI
Secretary — Mr. C. M. Pearson VK5PE
Broadcasts— 1820, 3550, 7125, 14175 kHz; 28.5 and 53.1 MHz, 2m (Ch. 8): 09.00 S.A.T.

**WA:**
President — Mr. R. Greenaway VK6DA
Secretary — Mr. N. R. Penfold VK6NE
Broadcasts— 3600, 7080, 14100, 14175 kHz, 52.656 and 2m (Ch. 2): 01.30Z.

**TAS.:**
President — Mr. R. K. Emmett VK7KK
Secretary — Mr. H. E. Hewens VK7HE
Broadcasts— 3570, 7130 kHz: 09.30 EST.

**NT:**
President — Mr. Doug Haig VK8JD.
Secretary — Mr. Henry Anderson VK8HA.
Broadcasts— Relay of VK5WI on 3.55 MHz and 146.5 MHz at 2330Z. Slow mo transmission by VK8HA on 3.555 M at 1000Z almost every day.

**Postal information:**
**VK1 — P.O. Box 46, Canberra, 2600.**
VK2 — 14 Atchison St., Crows Nest, 2065 (Ph. (02) 43 5795 Tues & Thurs (10.00-14.00h).
VK3 — 412 Brunswick St., Fitzroy, 3065 (Ph. (03) 41 3535 Sat 10.00-12.00h).
VK4 — G.P.O. Box 638, Brisbane, 4001.
VK5 — G.P.O. Box 1234, Adelaide, 5001 — HQ at West Thebarton Rd., Thebarton (Ph. (08) 254 7442).
VK6 — G.P.O. Box N1002, Perth, 6001.
VK7 — P.O. Box 1010, Launceston, 7250.
VK8 — (incl. with VK5), Darwin AR Club, P.O. Box 1418, Darwin, 5794.

**Slow morse transmissions** — most week-day evenings about 09.30Z onwards around 3550 kHz.

### EQUIPMENT TO UNLICENSED PERSONS

The ARRL has been promoting a code of ethics requiring, voluntarily any importer, manufacturer, distributor or dealer in amateur type gear to sign a pledge adopting the code of ethics. This is a pledge (backed up by counter and advertising display) that no amateur radio transmitters, transceivers and amplifiers will be sold at retail except to persons who can show that they are properly licensed to operate that equipment. The ARRL will publish a quarterly list of these companies supporting the code. — QST, Nov. '77.

### CW TESTS IN USA

"Code sending tests have been eliminated as part of FCC-administered examinations since this past August. However, the sending test is still required as part of every Novice examination." QST, Nov. '77.

### THIRD PARTY TRAFFIC

According to January 1978 QST the USA and Ghana have signed a third party traffic agreement.

### REPEATER JAMMING

From QST January 1978 come some ground rul recommended in the USA concerning repea jamming. Never, under any circumstances, recognise that there is a jammer on the frequency — jammers get no pleasure if they are not recognised, they need to know they have an audience. In very stubborn cases this may need to be varied. Repeater Groups should have technical committees, one function being to track down "undesired" signals. Where a serious problem exists contact the licensing authority for advice. ■

WARC 79 WARC 79 WARC 79 WARC 79

# USE THEM OR LOSE THEM

WARC 79 WARC 79 WARC 79 WARC 79

# WIANEWS

**RECORDS — VHF/UHF**

*This DX season (VHF) has produced a record number of records. Is this due to the increased number of operators or to an increase in the activity of sporadic E or TEP?*

*The first one to come in related to a 2-way 70 cm SSB contact between VK6KZ portable near Albany and VK3ZBJ at 10.17Z on 11th January. This was described in last month's AR VHF-UHF Notes. Following a thunderstorm, which struck the area almost immediately, VK6KZ/P used a 2m FM unit and quarter wave gutter whip to work through VK3RWZ. Next day he worked 144 MHz into VK5 on both SSB and the two Adelaide repeaters as well as a 432 MHz QSO with VK5MT. On the 8th January at 13.16Z he had a 144 MHz portable QSO with VK3ZQV at Carrajung.*

*The second one was a 2-way QSO on 2304 MHz (13 cm band) between Wally Green VK6WG in Albany and Reg Galle VK5QR in Enfield (about 1886 km distant) on 17th February at 07.50Z and again on the evening of 18th February. Wally commented that he could not say what next but maybe he will have [illegible]o at 10 GHz. Wally used almost wholly home brew gear to a [illegible]9BA triode with 700V at 68 mA on the anode into a home [illegible]de 6 ft. dish up about 40 ft. The write up from VK5QR con[illegible]ed this.*

*The third was a 70 cm contact on 22nd February at 13.55Z between VK6XY in Albany and VK3ZQV for which details are included in the VHF/UHF notes.*

*Congratulations to all concerned.*

*The great circle distance between Albany and Morwell is of the order of 2562 km. All these contacts were direct without the use of satellites, repeaters, EME or other such aids. The last known recorded world record for the 2.3 GHz band was 760 km on 30-6-1976 between G3LQR and OZ90R.*

*As reported in IARU News AR February 1978 (p. 26) a 5044 km contact was recorded between two South American stations on 2 metres.*

**REGULATIONS**

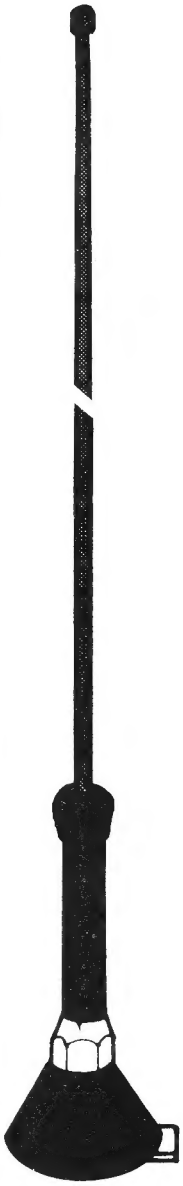
*Several letters were received from the Postal and Telecommunications Department during February.*

*RB4/4/23 of the 10th referred to the subject of 10 metre band beacons and is under consideration by the VHF/UHF Advisory Committee. RB4/4/5 gave covering approval of the suppresion of call sign details from the 1977 Call Book as [illegible]uested by the owners of the call signs at the time.*

*RB4/4/18 of the 21st provided for comments a re-write paragraph 94 of the Handbook. This has gone to the Federal WICEN Co-ordinator for study. Another of the same reference and data concerned Third Party traffic as related to paragraph 94 of the Handbook (i.e. Emergency Amateur Networks). RB4/4/29 of the 23rd gave covering approval of the additional (2 metre band) amateur repeater channels. These were advised to members in WIANEWS October 1977 AR, p. 5. Another of the same reference but dated the 22nd related to Repeater Conditions. This is with the Chairman of the Federal Repeater Sub-Committee. The question was reported in the Repeaters column in AR for September 1976, p. 21, but was referred to the Department in July 1976. Letter RB4/4/18 of the 15th provided a re-write of paragraphs 61 and 112 of the Handbook which mainly relate to RTTY operations. This last letter is under consideration by the Federal RTTY Committee. The re-write of paragraph 112 seeks to amend the existing 112 in another very important aspect and will be the subject of representations quite apart from the RTTY aspects. Finally letter RB4/4/18 received on 1st March intimated that proposals existed to amend paragraphs 39, 85-86, 87-89 and 90-93 of the Handbook as well as a complete revision of the book for which WIA suggestions would be welcome. Copies of all the letters quoted were mailed to Federal Councillors.*

*Members will undoubtedly wish to know what the various amendments to the Handbook entail since the door is open for comments by the Institute within a reasonable time. Institute comments will deprive from Divisions in the usual manner.*


# SCALAR
# for Antennae



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**Communication Antennae Engineers**

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| **VIC:** | Bail Electronic Services | Phone: | 89-2213 |
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*The proposed P. & T. re-writes of the paragraphs referred to in the letters as listed (except the final letter which is in general terms) are —*

*"94 (a) Approval for the participation by any recognised Amateur Civil Emergency Network in any national or local emergency (such as bushfires, floods or other disasters), must be obtained from the statutory authority responsible for the particular emergency, i.e. Natural Disasters Organisation, State Emergency Service or the Police, according to the local circumstances.*

*(b) The licensee of an amateur station may, at the request of such recognised Amateur Civil Emergency Network, participate in these special emergency communications networks, for and on behalf of the statutory authority responsible for handling such matters.*

*(c) In circumstances involving an extreme emergency, where no authorised emergency network has been established for the purpose, any amateur should act on his own initiative in a responsible manner."*

*"80. (a) Messages or visual images on behalf of third parties except for the purpose of providing communications as part of an authorised Emergency Amateur Network. For the conditions relating to the use of Emergency Amateur Networks, refer to paragraph 94 of this Handbook."*

*"61. Automatic Telegraph Systems.*
*The transmission of radio telegraph signals by an amateur station shall be in accordance with the following special conditions:*

*(a) The emission shall be:*
*F1 — frequency shift maximum not more than 850 Hz.*
*A2 or F2 — occupied band width to be confined within the limits ± 3 kHz.*

*(b) The code used shall be:*
*(i) five unit (start-stop) teleprinter code correspondence to the International Telegraphic Alphabet No. 2; or*
*(ii) seven unit (start-stop) data transmission code corresponding to the International Alphabet No. 5 (US ASCII or ANSCII), including the original ASCII and the Australian Standard AS XI for information exchange;*
*(iii) any other Internationally recognised code."*

*"112. (a) The operator of an amateur station shall transmit the call sign of the station being worked and the call sign of the station he is operating at the beginning and end of each transmission and not less frequently than once in every 10 minutes during the session.*

*(b) Stations transmitting the modes associated with Automatic Teelgraph Systems (F1, A2 or F2) and F4 emissions shall, in addition to identification on the mode in use as specified above, employ either:*
*(i) the International morse code; or*
*(ii) telephony*
*for identification at the end of each transmission. This supplementary identification to be in accordance with the emission authorised for use as indicated on the licence."*

**NOVICE EXAMINATION**

*Also during February talks were held with the Department at a high level by the Federal Education Co-ordinator concerning the issue of a long-awaited Novice examination syllabus, approval for the preparation and publication by the Department of a question bank for this examination and approval in principle to the establishment of a joint educational committee manned by WIA and Departmental representatives.*

*The Department approved the last two items but in relation to the Novice exam syllabus submitted by the Institute last year (see WIANEWS in AR July 1977, p. 4) the Department had drafted their own version despite a modicum of revisions submitted to them at the meeting. The WIA version attempts to define the depth of knowledge expected of candidates as well as listing in an appendix the topics considered to be outside the scope of Novice examinations.*

*The Departmental syllabus for Section O (theory) is prefaced by a paragraph stating that "questions are based on the elementary theory of radiotelephony and radiotelegraphy as applied to amateur transmitting and receiving systems and the elementary theory and practical application of the principle of electricity and magnetism". The syllabus then lists the items under 15 broad headings such as "electrical laws and circuits", "vacuum tube principles", "semi-conductor devices", "receiving systems", AM, Code, SSB, wave propagation, transmission lines, HF antennas, interference, test equipment and measurements to name some of them. Under these general headings appear appropriate sub or sub-sub headings devoid of further definition. As examples, there are AC phase and reactance, characteristics of pentode valves, junction diodes, bipolar transistors, PIV of rectifier circuits, voltage regulation, sensitivity and selectivity of receiving systems, the modulation envelope, balanced modulators, fading, line impedance, "matching transmission line to the transmitter", impedance of antennas, use of filters, dip meter, SWR, etc. The reference book is shown as the "current edition" of the ARRL Handbook.*

*It is understood the Department intends to publish this syllabus in booklet form along with their own 200 to 300 examination questions. The comment made to the Departmental representatives at the February meeting by the WIA was that the Departmental Novice Examination (theory) syllabus could almost be used intact by the AOCP examination.*

*The representations made by the Institute concerning the standard of the last Novice theory examination were successful. It is understood that a re-marking has been done resulting in pass marks being allocated to those who previously failed by a small margin.*

**CUSTOMS**

*Representations have been made to the WIA concerning import duties levied on 70 cm amateur equipment and the removal of the duty free by-law concessions on amateur antennas. These questions are under investigation.*

**EDP AND AR MAILING**

*At the Executive meeting in February the Institute's computer programme's conversion to the latest model computer at Monash was reported as almost complete. Quotations for the mailing of AR (of which inserts are a part) were being obtained from two other mailing services capable of handling address labels for Cheshire machines.*

**RTTY CONTEST**

*The Executive delegated to the WIA NSW RTTY Group the organisation and management of a Federal RTTY Contest subject to general acceptance of the rules and date. The contest is scheduled to be held during the VK/ZL/O phone contest later this year.*

**1978 CONVENTION AGENDA ITEMS**

*Seven items were received from the VK4 Division, some of which were procedural to introduce matters for discussion whilst others sought reviews. In brief these encompased —*

*Standard formula for selecting (Hon.) Life Members,*
*Review NAOCP exam standard,*
*Review AOCP exam methods,*
*Review existing and proposed legislation on sale or ownership of transmitting equipment by non-licensed persons,*
*Receive report on compensation for loss of 27 MHz,*
*Postage stamp to promote amateur radio,*
*Guidelines for membership recruiting drive.*

*Any member wishing to obtain details of Agenda Items should contact his Divisional Federal Councillor or write to the Executive office. It is understood other Agenda Items will be submitted by other Divisions but none was available at the time of writing this. The Executive will reject a number of procedural Agenda Items to permit discussions on IARU, WARC 79, and certain financial matters. In addition it is proposed to raise two additional matters (apart from recruitment and publicity), namely, (a) ways and means to retain the continuing interest of members in the WIA and (b) to discuss designs for badges, stickers, posters and other publicity material.* ■

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| WBFM | XD107-02 |
| (1-9) | $22.10 each |

**Oscillator Crystals** 50 kHz through 150 MHz available to order. Parallel resonant (30 pF) to 20 MHz, series resonant above 20 MHz. Write for quotation to your requirements (include mechanical size & frequency).

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| Filter Type | XF107-A | XF107-B | XF107-C | XF107-D | XF107-E | XF107-SO4 | XF102 |
|---|---|---|---|---|---|---|---|
| Application | NBFM | NBFM | WBFM | WBFM | WBFM | NBFM | NBFM |
| Number of Filter Crystals | 8 | 8 | 8 | 8 | 8 | 4 | 2 |
| Bandwidth | 12.0 kHz | 15.0 kHz | 30.0 kHz | 36.0 kHz | 40.0 kHz | 14.0 kHz | 14.0 kHz |
| Pass Band Ripple | ≤ 2 dB | | | | | ≤ 1 dB | ≤ 2 dB |
| Insertion Loss | ≤ 3.5 dB | ≤ 3.5 dB | ≤ 4.5 dB | ≤ 4.5 dB | ≤ 4.5 dB | ≤ 3 dB | ≤ 1.5 dB |
| Input-Output Termination $Z_t$ | 820 Ω | 910 Ω | 2000 Ω | 2700 Ω | 3000 Ω | 910 Ω | 2500 Ω |
| Termination $C_t$ | 25 pF | 25 pF | 25 pF | 25 pF | 25 pF | 35 pF | – |
| Shape Factor | (70 dB) 2.4 | (70 dB) 2.3 | (70 dB) 2.2 | (70 dB) 1.9 | (70 dB) 2.0 | (40 dB) 3.0 | (20 dB) 3.6 |
| | (90 dB) 2.8 | (90 dB) 2.9 | (90 dB) 2.7 | (90 dB) 2.5 | (90 dB) 2.5 | – | (30 dB) 5.7 |
| Ultimate Attenuation | > 90 dB | | | | | > 60 dB | > 30 dB |
| Size | 1-27/64" x 1-3/64" x 3/4" High Mounting Hardware Included | | | | | Hc 6/u can | Hc 18/u can |
| Price (1-9) | $40.60 | | | | | $18.95 | $7.95 |

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**Massachusetts 01742 USA**

Shipping weights: Filters 2 oz. ea., Crystals ½ oz. ea.
Registration Fee: $2.00; Air Mail: 31c per ½ oz.
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| **TRIO KENWOOD** new model TS-520-S | $ 685 |
| **TRIO KENWOOD** model TS-820S AC only 160 to 10 M with digital readout. | $1,050 |
| **TRIO KENWOOD** MODEL TS-820 AC only 160 to 10 M. | $ 900 |
| **TRIO KENWOOD** model TS-600-A FM - AM | $ 680 |
| **TRIO KENWOOD** model TR-7400 2 meter FM transceiver 10 to 25 watts output Frequency range 144.00 to 147.995 MHz | $ 400 |

**ICOM**

**VHF TRANSCEIVERS SSB**

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|---|---|
| **ICOM** model IC-502 6 M SSB portable transceivers 52-53 MHz | $ 215 |
| **ICOM** model IC-245 | $ 450 |
| **ICOM** 701 new model | $1,160 |
| **ICOM** model IC-211 | $ 785 |
| **YAESU MUSEN** FT 901 new model | $1,575 |
| **YAESU MUSEN** FT 7 new model | $ 570 |
| **YAESU MUSEN** model FT-101-E AC-DC transceivers 10 to 160 M with speech processor | $ 849 |
| **YAESU MUSEN** model FL-2100-B Lineal Ampl. | $ 569 |
| **YAESU MUSEN** FRG-7 Wadley Loop Receiver All solid state, 0.5-29.9 MHz in thirty 1MHz bands. Electronic band selection | $ 338 |
| **YAESU MUSEN** FL110 Solid State Linear Amplifier. Companion unit to FT-301S. 10-15W drive, 200W PEP Input, 160-10mx. | $ 249 |
| **YAESU MUSEN** YC-500E 500MHz Freq. Counter. Accurate to .02ppm. | $ 574 |
| **YAESU MUSEN** YC-500S 500MHz Freq. Counter. Accurate to 1ppm. | $ 446 |
| **YAESU MUSEN** YC500J 500MHz Freq. Counter. Accurate to 10ppm. | $ 319 |
| **YAESU MUSEN** YO100 Monitorscope. Matches the FT-101E, but can be used with other Yaesu equipment. (IF kits 455 kHz and 9MHz optional extra). **(IF Kits $12.00 each)** | $ 285 |
| **YAESU MUSEN** FTV-650B Six Metre Transverter. Converts 28 MHz. SSB to VHF, and includes receiving converter. 50W PEP. Primarily designed for coupling with Yaesu transmitters. | $ 249 |
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| **YAESU MUSEN** FT227 New model | $ 370 |
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| " | PA10 — | 140BL | 140 " | |
| " | PA 10 — | 160BL | 160 " | |
| " | PA 2 — | 70BL | 70 " | |
| 400-470 | PA10 — | 70CL | 70 " | |
| | PA 2 — | 12B | 12 Watts | |
| | PA 2 — | 25BL | 25 Watts | P.O.A. |

**New Shipment expected soon.**

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| HW - 40, 6 feet long for 40M | $ 25 |
| Swivel mounts and chrome-plated springs for all | $ 13 |

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|---|---|
| KEN model KR-400 for all medium size hf beams with internal disc brake | $ 138 |
| KEN KR500 | $ 150 |

All models rotators come complete with 230-volt AC indicator-control units.

6-conductor cable for KR-400-500 **65 cents per metre**

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| | |
|---|---|
| 1213 Mast clamp for 502CXX | $29.50 |
| 300 Mast Stay bearing for above | $32.00 |
| 301 Tower top bearing | $32.00 |

**HF ANTENNAS**

| | |
|---|---|
| **HADAKA** VS 40-80 Vertical | $ 115 |
| **HADAKA** VS 33 Tribender | $ 265 |
| DX 33 Western | $ 240 |
| **HADAKA** VS-22-3 Element 15-10m in balun | $ 173 |
| **HADAKA** VS-RG Radial kit for VS41 | $33.50 |

**COAX CABLE CONNECTORS**

| | |
|---|---|
| PL-259 | $ 1.20 |
| SO-239 Chassi Mount | $ 1.20 |
| Male to male joiner | $ 1.20 |
| Female to female joiner | $ 1.20 |
| Angle connector | $ 2.00 |
| T-connector | $ 2.50 |

**SWR METER**

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|---|---|
| Twin meter model: Y.M. - I.E. 3.5 to 145 MHz prof quality | $ 28 |
| DRAKE TV - 3300 TV 1 lowpass filter | $ 34 |
| **CRYSTAL FILTER**, 9MHz, similar to FT-200 ones. With carrier crystals. | $ 35 |
| APOLLO 3 position co-ax switches | $ 15 |

**MORSE KEYS**

| | |
|---|---|
| **EK-127 Electronic Keyer** | $ 99 |
| **EK-150S Single Paddle Electronic Keyer** | $ 136 |
| **EK-150D Double Paddle Electronic Keyer** | $ 136 |
| **MK-1024 Programmable Keyer**, 1024 bit memory | $ 233 |

**HI-MOUND**

| | |
|---|---|
| **HK-710** De luxe heavy duty morse key. Heavy base. A really beautifully constructed and finished unit. Fitted with a dust cover, standard knob and knob plate. Ball bearing shaft. | $ 45 |
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| **BK-100 (BUG)** Semi-automatic bug key, fully adjustable | $ 49 |

VALVES 572 B **$55**, 6KD6 **$12.50**, 6JS6 **$10.50** 6JM6 **$9.50**, S2001 (6146B) **$13.50**, 12GB7 **$8.50** 7360 **$14.50**, 6GK6 **$6.**

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# A DIFFERENT MULTI-BAND AERIAL SYSTEM

H. F. Ruckert VK2AOU

**Due to the present low sun activity not too many European amateur stations are being heard in VK-land. Of those, who still put a good signal through via the short path on 14 MHz at 1200Z time and via the long path at 0800Z, more and more central Europeans — especially from DL — report that they use a VK2AOU or VK2AOU/DJ2UT beam. The writer believes, that mainly those VKs who had not joined the radio amateur ranks 20 years ago, when a number of multiband aerials were developed, may like to know what this aerial is all about, which can now be found in European antenna books under a VK call.**

Until the early fifties we had only the three stacked 14, 21 and 28 MHz yagis called fittingly "Christmas Tree" for efficient DX work needing only one mast and rotator. For most of us it is still difficult enough to build and tune a single yagi beam, and three stacked beams would beat nearly all of us but a few brave ones. In 1956-58 approaching the geophysical year and record sun spot count of 300, several amateurs tried to do something about the antenna problem for 14, 21, and 28 MHz operation, and a number of new beams were invented especially mini types.

We all know the W3DZZ trap aerial as dipole, ground plane and yagi tribander. The disadvantages and difficulties presented by this aerial, compared with a single band full size yagi, are that at 14 and 21 MHz the element is of less than full size causing reduced gain and bandwidth (frequency band of low swr and high f/b-ratio). It is a major problem to seal the traps (tuned circuits) so that moisture and polluted atmosphere do not cause corrosion at element, coil, and capacitor contacts, especially if dissimilar metals are used. A compromise for trap-Q and bandwidth has to be chosen. On 14 MHz four traps per element are part of the element, and contact resistance at the traps causes losses. This triband yagi is now the most widely used amateur DX aerial and is manufactured in several countries.

Substantial initial interest, except in W-land (not invented there), gained the G4ZU multiband method (British patent No. 790, 576 of 12-2-1958).

The inventor claimed (AR September 1956 by G4ZU and AR April 1957 by VK6GU):

1. A beam element, which on its own resonated near 21 MHz, was made to resonate near 14 MHz by inserting a loading coil or twin boom hairpin loop in the middle.

**Fact:** The coil actually used had only about half the inductance a coil would need to act as claimed.

2. An "automatic switching stub", in form of a piece of twin lead or coaxial cable open at the far end, was connected parallel to the loading coil. The stub was to act as an electrical short circuiting means when the aerial was used at about 21 MHz, because the stub alone resonated at this frequency, eliminating electrically the tuning effect of the loading coil at 21 MHz.

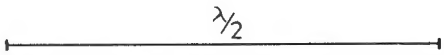
**Fact:** An open ¼ wave stub acts under flat line matched conditions as a near short, but G4ZU had a different case and insisted that the stub cable had to have a very special velocity factor (e.g. capacitance per unit of length). It appeared to the writer that the cable capacitance with the parallel inductor did the *two band tuning* and not the stub as claimed *the automatic 21 MHz band switching.*

3. The 28 MHz tuning was not explained by G4ZU, and in private correspondence the inventor stated that the coil to mounting channel capacitance did the trick together with a part of the stub.

**Fact:** By placing the stub cable inside the element or double boom tubing the so obtained coupling of distributing L and C caused the 28 MHz resonance to occur and others too.

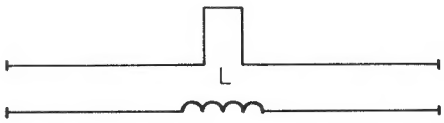
The experiments which demonstrate these facts can easily be repeated. They were described in AR May 1958. In AR June 1958 the writer described a three element triband beam which incorporated what was learned from the investigation.

**EXPERIMENTS:**

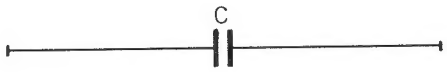



Dipole resonating at . . .

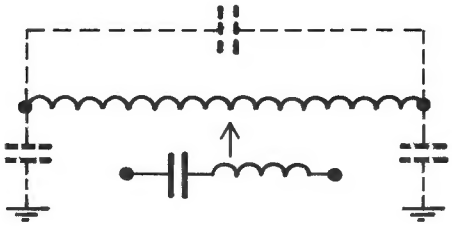
$$f_{MHz} = \frac{300}{\lambda m}$$



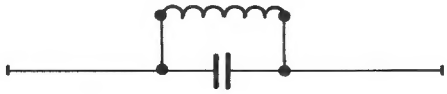

Dipole tuned to lower frequency due to laoding inductance "L".



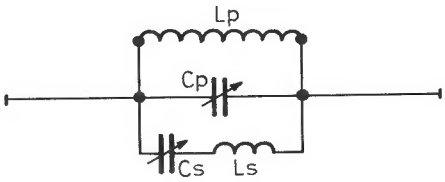

Dipole tuned to higher frequency due to capacitance "C".



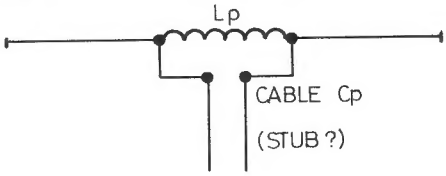
Dipole equivalent circuit formed by distributed "L" and "C" components, e.g. a series tuned circuit.

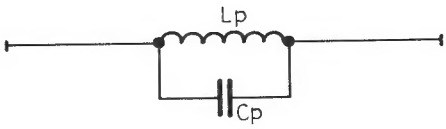


Parallel tuned circuit.




Paralleled parallel (Lp + Cp) and series tuned circuit (Ls + Ls) form the "multiband tank" used in the past in transmitters to cover 3.5 to 30 MHz without coil switching with ganged 150 pF variable air capacitors. There are always two resonances occurring at the same time within the ranges: 3.5 to 8 MHz (Lp and Cp) and 7 to 30 MHz (Ls and Cs), depending on the Cp and Cs setting.



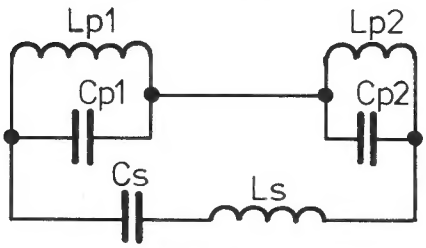




We can replace the series tuned circuit Ls and Cs by the two dipole element half elements, and we can also replace the (G4ZU stub) cable capacitance by a lumped capacitor of the same value to obtain in both cases two-band aerial elements, for example for 14 and 21 MHz, 21 and 28 MHz, or 70 and 180 MHz. The cable (stub) resonance and the velocity factor of the cable used is of no consequence — only the cable capacitance

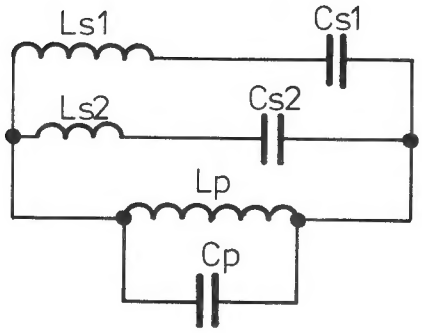
matters (AR May 1958 detailed experimental evidence). Lp acts as dipole-L-increase and Cp as the opposite. Lp may be a coil, a hairpin loop, or a double boom with shortening bar. Bringing the cable (Cp) near the element creates a coupling of distributed L and C and more resonances, e.g. at 28 MHz and higher frequencies under certain conditions. This form was too difficult to tune, and unwanted resonances occurred as well.

After it was understood what made the G4ZU beam work on three bands, the writer looked for a well controllable and tunable *three frequency circuit* convertible into a *triband aerial element.*

To obtain resonances on three different frequencies (e.g. 14.15 MHz, 21.25 MHz, and 28.6 MHz) at the same time without switching inductors or changing capacitors we need three inductors and three capacitors suitably arranged.

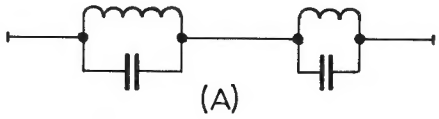



(A)

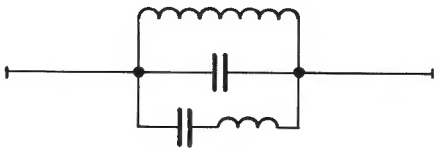



(B)

The two circuit versions shown fulfill this requirement. By adjusting the three L and C values the three simultaneous resonances can be moved over a wide range. As previously described one series tuned circuit can again be replaced by a dipole to obtain a triband aerial element. In **A** we have then two differently tuned parallel tuned circuits in series, and in **B** we have a series and a differently tuned parallel circuit in parallel in the middle of the aerial element. This "triband element" may be any yagi type radiator, director or reflector, the ground plane radiator or a cubical quad element. The dipole may have any length from ½λ/2 to 2 × λ/2, e.g. from mini beam to full size beam. The mini beam uses larger tuning inductors. The tuned circuits are not tuned to the aerial operating frequencies, and should not be confused with dipole and traps (W3DZZ type).



(A)



(B)

Mainly the "A-version" was built in yagi, ground plane, and quad form by a number of amateurs in several countries since 1960. Descriptions appeared in VK, ZL, DL, W-land by the writer. RSGB declined to reprint the VK paper. Other amateurs described their experience with this system in JA, ZS, DM, OK, etc. Aerial manufacturers showed no interest. This is a true triband antenna element, where the full element is used on all three frequency bands, without the unused dipole ends of the W3DZZ system.

DJ2UT was particularly successful in using this triband tuning system, and asked the writer for the permission to produce this aerial and to call it the VK2AOU beam. No patent cover had been arranged, because industry often waits until the 16 years a patent runs are over, unless the inventor has mass production facilities and threatens their present market share. DJ2UT continued the aerial development where VK2AOU had to stop, mainly due to backyard size limitations. OM Sommer extended later the elements to 14 MHz full size to be competitive with other full size yagis. On 21 MHz the element had 1.5 × λ/2 length and on 28 MHz the element had even 2 × λ/2 length (collinear), which resulted in superior gain and bandwidth on the 15m and 10m band. The front to back ratio (f/b) and so the reflector gain and bandwidth were improved by feeding this element as well via a crossed phasing line, resulting too in more concentrated radiation in the vertical lobe plane. Only 2m reflector to radiator and radiator to director spacing was needed, forming a very short beam, which was also strengthened by using a twin boom with 25 × 3 mm Al-Mg-Si corrosion resisting tubing. All clamps are Al-alloy castings. Only stainless steel screws, bolts and nuts are used to avoid electrolysis and corrosion at contacts of dissimilar metals.

Over the years the mechanical design was improved and strengthened, until ice loading and storms left this beam intact whilst other makes failed.

The feeding with a simple coaxial cable presented a number of problems, because the impedance and phase changes dramatically, especially at 21 MHz, between and outside the tuned circuits. T-match feeding of radiator and reflector gave finally the desired and easy to control results. The 28 MHz matching is improved by selecting a suitable L/C ratio for the tuned circuits. By placing proximity or matching elements for 21 MHz and 28 MHz in front of and near the radiator the impedance at the 14 MHz T-match points was also made suitable for 21 MHz and 28 MHz operation. At 21 MHz the resonances of the radiator and the also fed 21 MHz match element are above and under 21.25 MHz respectively, similar to a band filter. At 28 MHz the match element acts also as a futher director. The centres of the long elements and the 21 MHz match element have a polycarbonate casting, which seals and holds the coaxial cable capacitors of about 75 and 100 pF, the stubs for the 7 and 10 mm tubing of the hairpin loop (length pre-set but adjustable) and the 30 mm x 2 mm element tubing centres. Two part clamps and three bolts hold each of the five elements to the boom and to the boom to mast mounting bracket. The reflector phasing line has three plastic spacers. An insulated wire and a clamp for the mast extension are supplied to support the boom and avoid sagging (snow and ice load in some areas).

The antenna can handle 2.5 kW r.f. power continuously. The tuning elements carry no high r.f. voltages as in the trap beam case. The weight with the original tubing amounts to 23 kg. The turning radius is 5.8m. Wind load data: Antenna area 0.65m², load 52 kp below 20m height and 72 kp above 20m installation height.

Galvanised copper solder lugs are used to attach the RG8U coaxial cable feeder. The use of the popular Ferrite Balun (ratio 1 : 1) is not recommended to obtain symmetrical feeding of the beam halves because it was discovered that the same degree of coupling was achieved without this core. This is in contrast to the popular belief. DJ2UT advises to use 3.5 of the feeder coaxial cable in the form of a closely would six turn cylindrical coil near the beam feed point to achieve balanced feeding.

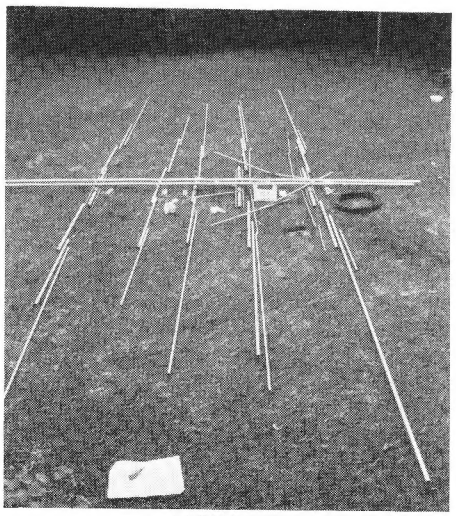


**FIGURE 1**

Within Europe all beams are shipped by rail. It was in my case simpler to obtain all the one metre or shorter parts by post in two parcels (1m is mail service limit length), and to purchase the 4m long boom tubes and long element tubing ends locally. **Fig. 1** shows all beam parts prior to assembly on the lawn. Parts and part positions are colour coded and a detailed description is supplied.

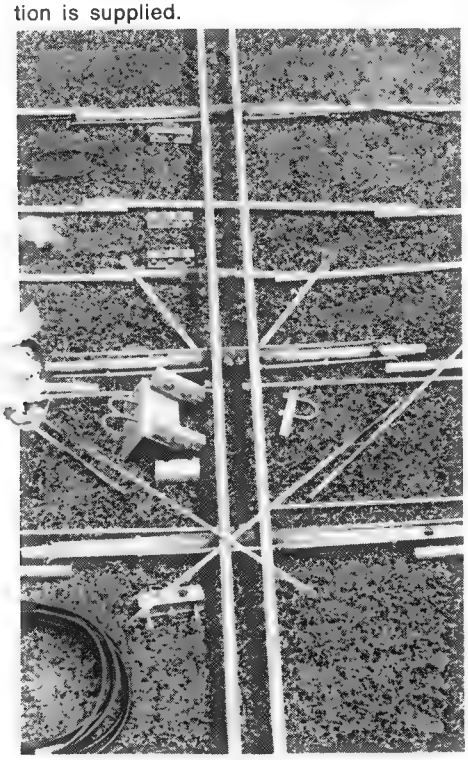


FIGURE 2

**Fig. 2.** This is a close-up picture of the element centres with the coaxial cable capacitors, the T-match 10mm diameter tubing and phasing line. Two plastic bags (left side) contain nuts and screws, clamp rings to hold element tubing of different diameter securely together but adjustable if required. The six two part boom to element clamps are visible, and so are the six hairpin loops.

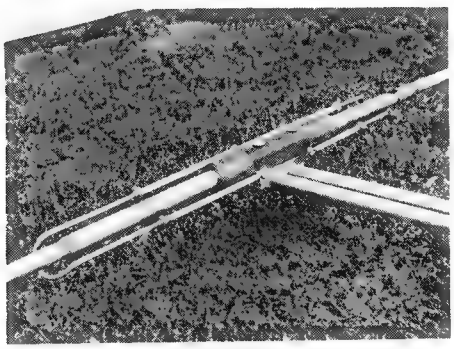


FIGURE 3

**Fig. 3.** Triband director centre.

**Fig. 4.** Triband radiator centre, mast bracket, feeder to radiator (part of T-match), and 21 MHz match element centre (left top), and part of reflector phasing line.

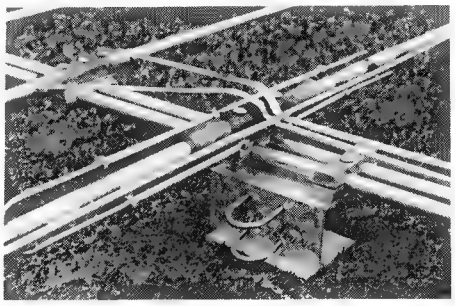


FIGURE 4

FIGURE 5

**Fig. 5.** Triband reflector centre with part of T-match and crossed λ/4 phasing line.

FIGURE 6

**Fig. 6.** Assembled VK2AOU/DJ2UT beam model: Periodic-5-C (formerly called HP-44). (A periodic-6-C beam with a further triband director is also produced, having a six metre long twin boom.) The term "periodic" is used due to the similarity of some features of this antenna and a log-periodic beam. "C" stands for polycarbonate centre insulator.

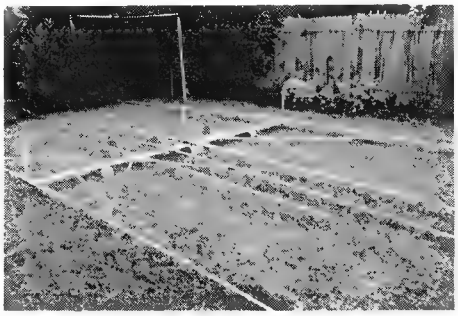


FIGURE 7

**Fig. 7.** Due to the fact that the locally available tubing was heavier: 20mm x 2mm (not 1.5mm) and 16mm x 1.6mm (not 15mm x 1mm), the writer decided to add supports for the long elements avoiding sagging (PVC tubes, nylon cord and epoxy end insulators). DJ2UT reckons that it was not necessary to add PVC tubes as triangular bracing between elements and boom. "It is no good to be sorry after a cyclone storm."

**Fig. 8.** The beam three metres high, doing already DX work. The photographs show that a lot of construction effort, engineering experience and money for tooling were necessary to arrive at this technical perfection.

**ELEMENT LENGTH — Fig. 9**

| | |
|---|---|
| Director | 8.6m |
| 28 MHz match element | 4.9m |
| 21 MHz match element | 6.7m |
| Radiator | 10m |
| Reflector | 10.6m |
| Radiator T-match | 2 x 1m |
| Reflector T-match | 2 x 1.4m |
| Radiator to 21 MHz match element spacing | 0.4m |
| 28 MHz match element to 21 MHz match element spacing | 0.4m |
| Director to radiator to reflector spacing | 2m each |

**PERFORMANCE**

Similar to a multi-element (new) trap beam (W3DZZ type) of 7 to 8m boom length but with superior forward gain and reflector bandwidth. On 20m, due to also fed reflector, performance better than a two element quad and three element full size yagi. On 15m, due to 50 per cent extended elements, performance similar to a four element full size yagi. On 10m, performance is due to collinear (double length) elements and the 10m match element similar to a five or six element yagi.

**GRAPHS — Figs. 10, 11 and 12**

Three graphs show the forward gain, voltage swr and front to back ratio of a typical periodic-5 antenna, and the bandwidth of all three parameters, which is wider than found on trap beams . (Test dipole at same height, 10λ apart.)

There is an important difference between DX performance and the usually quoted gain, which is measured with a test dipole at the same height as the beam under test and a few wavelengths apart. In this way it is possible that a low gain ground plane antenna with very low angle radiation (6°) shows more gain than a high gain beam with 20° elevation of the main radiation lobe. Gain and DX performance can be compared if the power from the main radiation lobe area is integrated (see "All about cubical quad atennas" by W. Orr W6SAI, page 25, calculation method by W7GRA). This can be done on UHF antenna models in the laboratory, or an aircraft flying in circles at various heights around the antenna has to be used to carry out the field strength measurements.

The vswr curves are shown as a band, because nearby objects (trees, buildings) have a more or less disturbing effect. ■

1. Walfried Sommer, DJ2UT, D-7809 Denzlingen, Kandel Str. 35-37, West Germany.

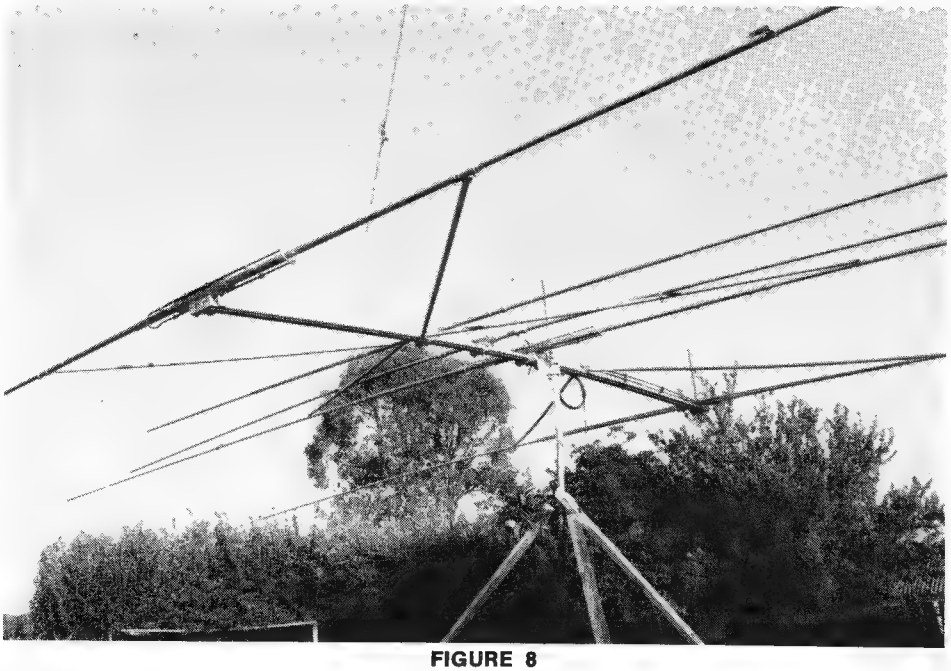


FIGURE 8

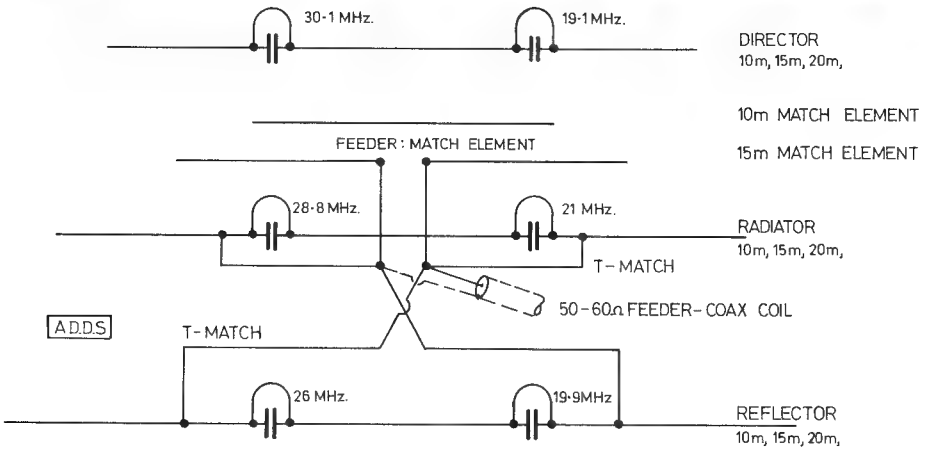



FIGURE 9

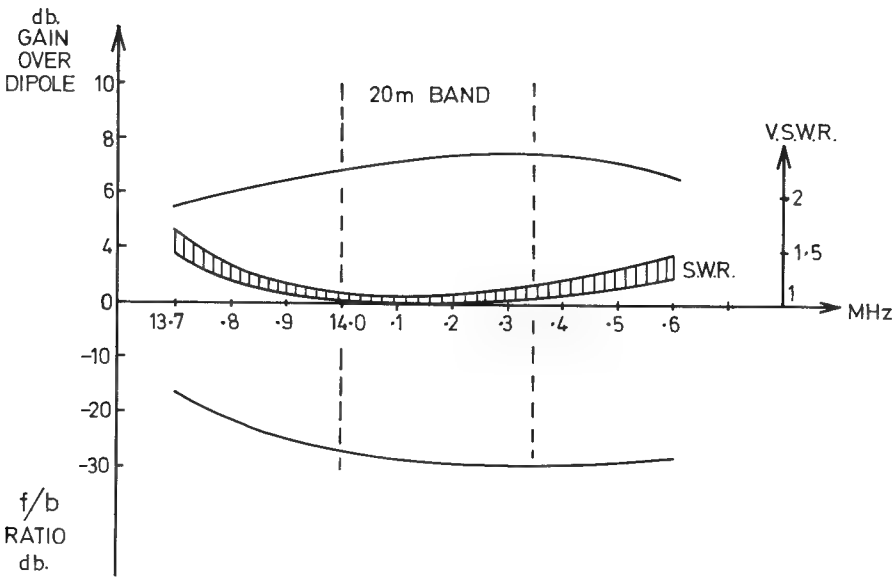



FIGURE 10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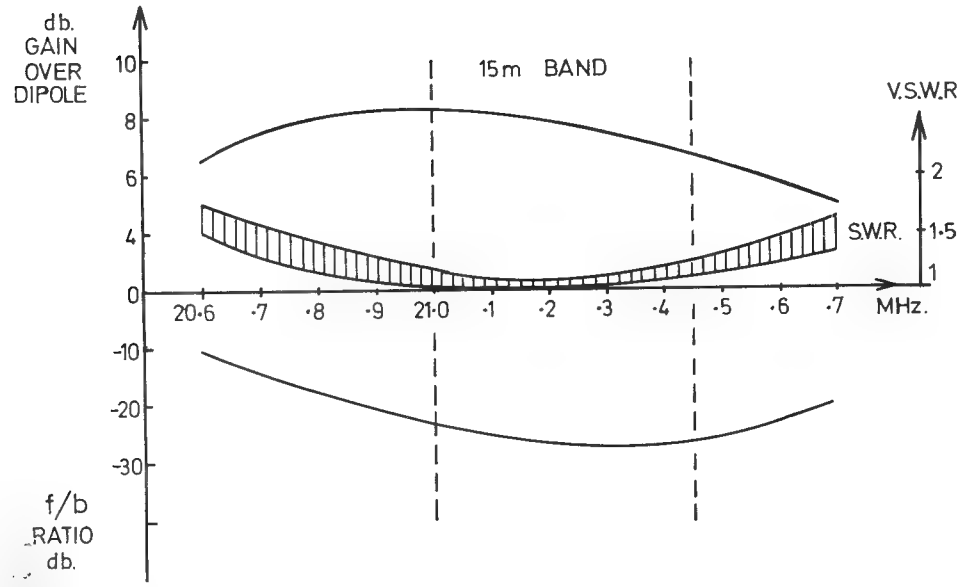



FIGURE 11

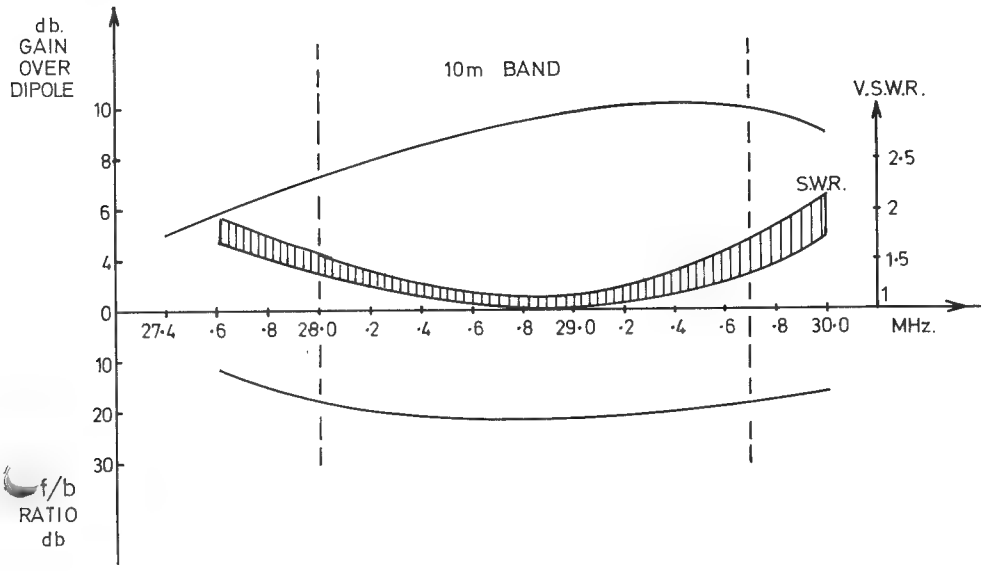



FIGURE 12

# FEBRUARY 1978 AOCP EXAM

**POSTAL AND TELECOMMUNCATIONS DEPARTMENT**
**AMATEUR OPERATORS' CERTIFICATES OF PROFICIENCY**

February, 1978.

**SECTION M (Theory)**
(Time allowed — 2½ hours.)

NOTE: *SEVEN questions only* to be attempted. Credit will not be given for more than *SEVEN answers. All questions carry equal marks.*

1. (a) Explain the fundamental difference between frequency modulation and amplitude modulation.
   (b) With the aid of a circuit diagram, explain the theory of operation of the discriminator stage of a receiver suitable for reception of frequency modulated signals.
2. (a) With the aid of a circuit diagram describe the operation of each stage of an amateur transmitter capable of operating in the 14 MHz (20 metre) band.
   (b) Explain how you would tune each stage of the transmitter.
3. Draw the circuit and briefly explain the operation of a grounded grid R.F. stage of a receiver operating in the VHF range. With reference to operation on frequencies of the order of 144 MHz, list any advantages this type of amplifier may have over that of the normal type.
4. (a) With the aid of a suitable sketch, describe the construction and principle of operation of a moving-coil (dynamic) type microphone.
   (b) Compare the frequency response and output level of a moving-coil type microphone with a carbon granule type microphone.
5. (a) With the aid of a circuit diagram describe the operation of a full-wave HT power supply which uses silicon rectifiers.
   (b) Discuss any advantages and disadvantages silicon solid-state rectifiers may have when compared with the vacuum-tube type.
6. (a) What do you understand by the term "standing wave ratio" when applied to an RF transmission line?
   (b) How would you detect the presence of standing waves on a transmission line?
   (c) What does a high SWR on a transmission line feeding an antenna indicate? How can the SWR be reduced?
7. (a) Assisted by a circuit diagram describe a variable-frequency oscillator (VFO) suitable for use in the 3.5 MHz band.
   (b) With reference to a VFO, discuss the factors upon which the stability of the generated frequency depends.
8. (a) With the aid of a circuit diagram describe the operation of a product detector suitable for use in an SSB receiver.
   (b) What ratio of BFO to signal input voltage to the product detector do you consider satisfactory to obtain good resolution of the SSB signal?
9. Two resistors of 10 and 30 ohms respectively are connected in series and placed across a 24 ohm resistor, a supply voltage of 30 volts is connected across this combination.
   Calculate:—
   (i) the total current drawn from the supply; and
   (ii) the power dissipated in each of the three resistors.

**COMMENTS ON FEBRUARY 1978 AOCP EXAM THEORY PAPER**

The February exam was of the same type and style as in previous years. No new ground was broken and some of the questions were a little dated.

A question on a grounded grid RF amplifier is completely out of date as valves have long been superseded at VHF and UHF by semiconductors. This question could have been very simply updated into the current technology as grounded base

and grounded gate amplifiers are in general usage.

Similarly the use of vacuum tubes as rectifiers is nowadays an anachronism and should not be included in the exam. The question could surely have been reworded to probe knowledge of rectifier techniques and basic theory.

The rest of the paper was more or less standard with a few twists in the wording which would only upset those candidates with a sketchy grasp of the subject.

FM was once again on the paper which is a good sign as it is currently used extensively in a first rig. However some discussion of basic repeater principles would appear timely also.

Similarly so many rigs now use phase locked loops and digital counters that these items must surely be included in the exam soon. ■

# AUTOMOTIVE RADIO NOISE ELIMINATION

Graham Wiseman VK5EU

**The author has had considerable experience in the field of mobile radio installation. Many of the applications involved operation over considerable distances, under weak signal conditions. The following is the result of much experimentation into reducing vehicle noise.**

## SOURCES

There are many sources of noise in mobile installations. The major ones are:—

**Ignition noise** — regular clicks or plops, changing in frequency as engine revs vary.
**Alternator or generator noise** — whistle, whine, or high frequency buzz, also varies as engine revs vary.

**Appliance contact noise** — ranges from slow clicks through to a continuous or interrupted hiss type noise, not usually related to engine revs.

## CURES

The cures for any particular problem can be many and varied. Often a cure which works on one vehicle does not on another. Some of the available remedies are listed below. These are the ones I have had the greatest success with.

1. **Ignition Noise**
   (a) Use ignition suppression leads for plug and distributor EHT leads. (Or suppressor resistors.)
   (b) Install bypass capacitor on ignition switch side of ignition coil, mount under coil mounting bolt.
   (c) If ignition points lead is run in vehicle wiring loom, improvement can sometimes be made by replacing it with a separate lead.

2. **Alternator or Generator Noise**
   (a) Install bypass capacitor (coaxial type for HF, VHF and UHF) in alternator or generator output lead — install capacitor as near as possible to generator or alternator (preferably on it).

3. **Appliance Contact Noise**
   Install a bypass capacitor across the supply to any appliance or attachment which generates noise, e.g. windscreen wiper motor, heater, fan motor, etc.

4. **Cures of benefit for Ignition, Alternator, and Contact Noise**
   (a) Install bypass capacitor across battery supply to radio.
   (b) Ensure braid of antenna feed coax. makes a low impedance connection with the antenna ground at the antenna, and with set ground at the set.
   (c) Extreme cases may require complete shielding and isolation of ignition system or offending appliance.
   (d) Install ground straps —
      (i) Bonnet to nearest point of body (good ground).
      (ii) Engine block to chassis.
      (iii) Tailpipe to chassis (at rear).
      (iv) Between bolted or rivetted body panels.
      (v) Between ignition coil case and distributor case.
      In some cases multiple straps may be required.

5. **Wheel static** — may be cured by using conductive grease in wheel bearings.
   **NOTE**—Suppression devices should be installed as near as practical to the noise source. Capacitors should be earthed to the same earth point at the noise source.

I have been installing the above as standard precautions per —

MF, HF: 1(a), 2(a), 4(b), 4(d) (i).
VHF, UHF: 1(a), 2(a), 4(b).
Other measures are taken on an individual requirement basis. ■

# OLD-TIMERS OVERSEAS

Dick VK3SV

From time to time we come across VK amateurs whose "radio-activity" has extended far beyond the nominal three score years and ten. What of other old-timers whose homes are far beyond our shores? One of them undoubtedly is 9M8HG, Horace Gray at Kuching, in West Malaysia.

Now in his 81st year, Horace is still putting out an FB signal from his modified TS510, running 80 watts into a dipole at 30 feet. Neither his voice nor his crisp operating gives any indication of his age, and the fact that he has been active in radio for well over half a century must come as a surprise to those working him for the first time.

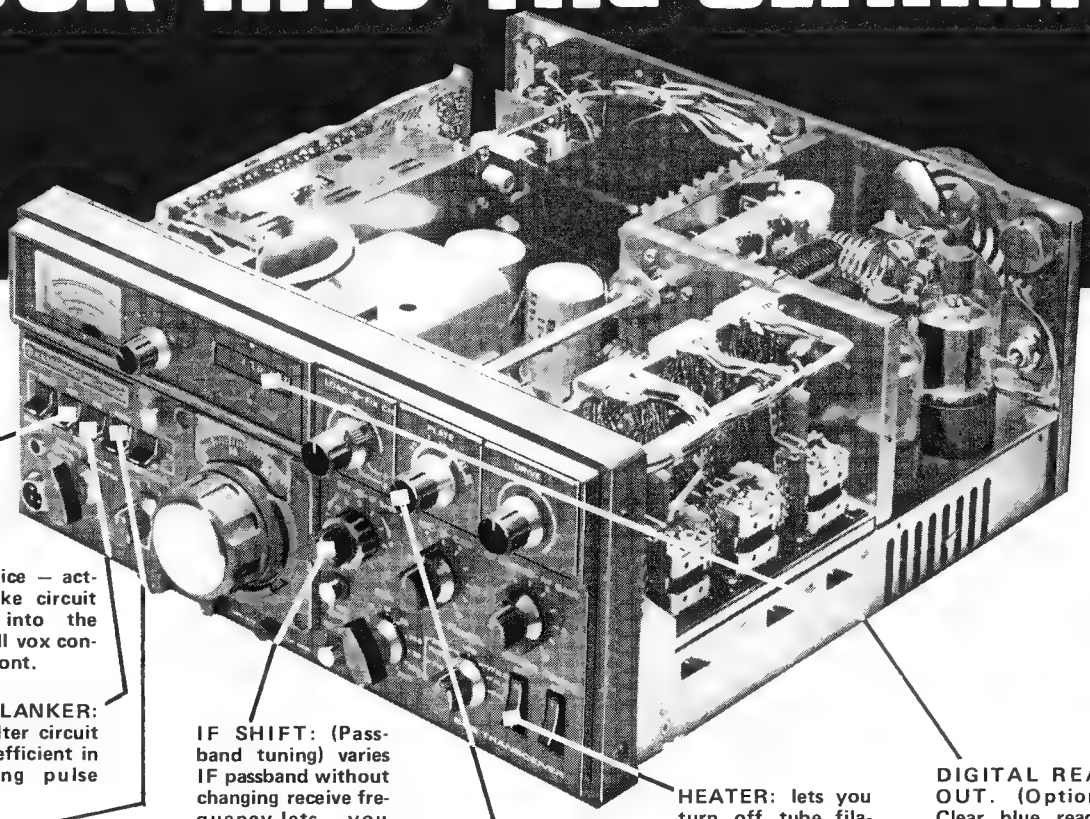
Horace was first licensed in 1924 and operated as OB2SK over the next eleven years. In 1932 he won the World DX Contest using a 5 watt home brew rig. In 1936 he moved QTH and operated as VS5AC until 1941. Then followed several years of internment, and after this a long period of recuperation and rehabilitation. Unable for various reasons to "get back on air", Horace maintained his interest in radio by monitoring and reporting the world's B/C stations between 1963 and 1974.

At long last, after an enforced absence of 33 years, Horace returned to amateur activity as 9M8HG on 23rd August, 1974, at the age of 77. For brief periods in 1974 and 1975 he also operated as PA9AEU and G4EPT.

Horace's QSL card is literally a "piece of history". Designed originally as a reception report, it is headed "Kuching, Sarawak, Isle of Borneo", and beneath this, in colour, is the national flag. On the left, also in colour, is Sarawak's emblem, the hornbill, and on the right a photograph of a head hunter. Diagonally across the card, in Horace's impeccable handwriting, is his present call sign.

A memorable card from a truly remarkable old-timer. ■

# LOOK INTO THE ULTIMATE



VOX: Voice – activated mike circuit is built into the TS820. All vox controls up front.

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IF SHIFT: (Passband tuning) varies IF passband without changing receive frequency-lets you eliminate unwanted signals. RIT lets you vary receive frequency 5k Hz either side of VFO.

VERNIER: Plate tuning control has vernier for fast precise tune-up adjustment.

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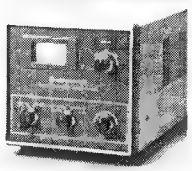
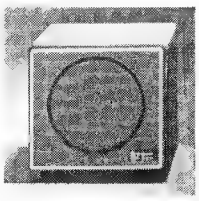
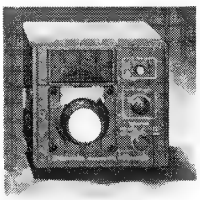


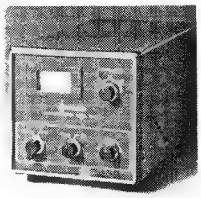
TV506: 6MTR band transverter



SP-520: 80hm external speaker



VFO820: Remote VFO 5.0 – 5.5 MHz



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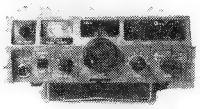

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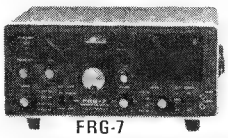

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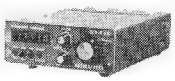

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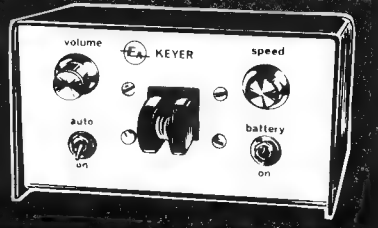


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# TWO MULTIBAND ANTENNAS FOR THE 160 METRE ENTHUSIAST

Arthur Solomon VK3LJ
428 Ligar Street, Ballarat 3350

**Multiband antennas proliferate in amateur literature but few of these can be operated conveniently on 160 metres. Here are two multiband antennas which resonate on various bands from 160 metres upwards and both have been used at this QTH with excellent results. The diagrams show the details of these antennas, including information on the VK5QV traps used. The VK5QV traps are simple and inexpensive to build, a delight to tune, and they are utterly stable in operation.**

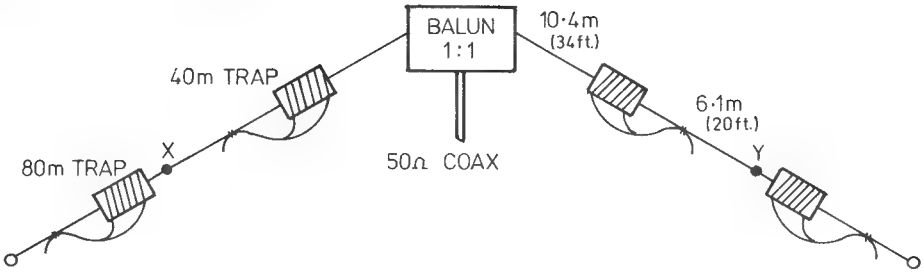


FIG. 1

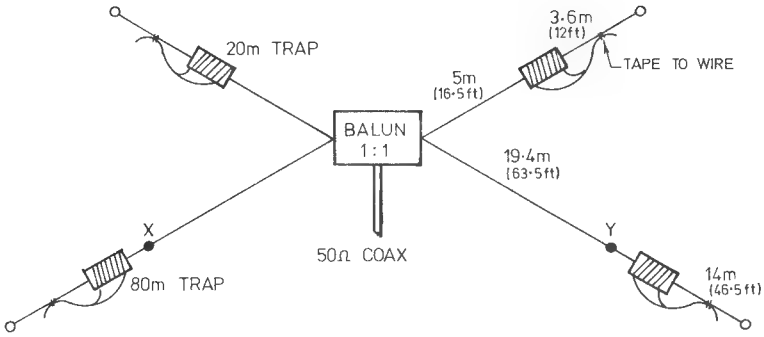


FIG. 2

| Trap | Coil | Coax. Capac. |
|---|---|---|
| 20m (14.2 MHz) | 2.5 μH<br>10t. 7/.0076 PVC covered hook-up wire, 1⅛ in. o.d. PVC circuit | 47 pF<br>approx. 29 ins. RG 59/u coax. |
| 40m (7.07 MHz) | 10.7 μH<br>38t. 7/.0076 hook-up wire. 1 in. o.d. PVC conduit. | 47 pF<br>approx. 28 ins. RG 59/u coax. |
| 80m (3.60 MHz) | 27 μH<br>25t. 7/.0076 hook-up wire. 2¼ in o.d. PVC irreg. pipe. | 80 pF<br>approx. 48 ins. RG 58 coax. |

**NOTES:**

1. **All coils are close wound.**
2. **Coaxial cable lengths should be treated as very approximate. Cut to longer lengths and trim back as GDO to frequency.**
3. **Antenna wire lengths above are only a guide. Allow extra length and prune as explained in text.**
4. **The braid of the coaxial capacitors is soldered to the OUTER wire sections of the antenna and the coax. itself is taped to these outer sections.**

First, let us consider the antenna shown in Fig. 1. This is a single antenna, fitted with traps so as to operate on 40, 80 and 160 metres. It also has a very low VSWR on 15 metres. Although quite a long antenna (approximately 175 feet span), it is still considerably shorter than a full-scale inverted vee for 160 (260 feet). The VSWR is very low on 15, 40 and 160 metres but you will find, in all probability, that the usable bandwidth on 80 metres will be restricted to about 120 kHz. This is not unusual with multiband trap antennae — compare the 18 AVT. If you do not relish this situation then you have at least three alternatives: (a) switch in an ATU to cover those sections of the band where the SWR is too high for comfort, (b) use an ATU for the 80 metre band entirely and operate bare-foot on the other bands, or (c) erect antenna in Fig. 2.

The procedure for setting up the antenna is quite simple. First put up the 40 metre sections, including the traps, and adjust the wire lengths for a VSWR of 1 to 1 at the trap resonant frequency. Next, add the 80 metre sections, including traps, and adjust the 80 metre wire sections for minimum SWR. Finally, add the 160 metre wire sections and adjust these for a 1 to 1 SWR at the centre of the band. That is all there is to it; there should be no necessity to go back and readjust any of the earlier sections.

The antenna shown in Fig. 2 is the one at present in use at this QTH. As is evident from the diagram, it is a combination of the multi-dipole concept and the trap concept; it consists of two trapped inverted vees fed by a common feeder. It covers all bands from 15 through to 160 metres; the VSWR is very low on all bands and no tuning unit is required. (Incidentally, it also covers 11 metres but this is of little value to us now.) If you wish to cover 10 metres also, you would need to insert 10 metre traps in the 20/40 metre vee.

The method of setting up the antenna in Fig. 2 is much the same as for the first antenna, except that two trapped dipoles have to be adjusted. First set up the 20/40 metre dipole and adjust the wire sections (as for Antenna A) for a 1 to 1 VSWR on both bands. When that is completed, repeat the procedure for the 80/160 metre dipole. I found that there was very little interaction between the two dipoles.

Admittedly, both of the antennas described here are long antennae, but they can be reduced considerably in span by bending the ends back at the points indicated in the diagrams (X, Y). By doing this Antenna A could be reduced to the span of a G5RV and Antenna B to that of an 80 metre dipole.

Two final comments: (1) antennae of this kind greatly simplify operating procedures. You can tune up quickly and completely on a dummy load and then switch into the antenna system to begin *immediate* operation without the additional fussing with an ATU (with its attendant QRM on the band ). This enables you to change bands in seconds, not minutes! This kind of convenience has to be experienced to be appreciated. (2) Although details of the traps are given in the diagrams, you would be well advised first to refer to the admirable article of Ivan Huser VK5QV, "A Simplified Method of Antenna Trap Construction", in March 1977, AR. The only alteration I have made to the disposition of the traps is to tape the coaxial capacitors to the antenna wire for greater mechanical strength and (to my eye) a more pleasing appearance. ■

# A SCANNER FOR THE KYOKUTO SXR11

Martin Willems VK4ZIL
P.O. Box 407, Coolangatta

**Kyokuto owners! Are you missing out on all the lovely DX? Do you sit on one particular channel and wait for an interesting DX signal? Do you frustratingly hop from channel to channel and find that the signal you were hoping for has already been claimed by another?**
**If this is the case, help is at hand.**
**If you, as the author does, go to each beacon frequency in the hope of hearing a ZL beacon, or some other rare two metre signal, relief is here.**

The recipe for this is very simple: Take one Kyokuto, add five fourteen-legged fuses, mix in three BC108 transistors, a dash or fifteen of small diodes, a pinch of eight resistors, and for flavour about four little capacitors. For good measure throw in a switch (or use the on/off switch already available), stir in a bit of quick-stick glue to hold it all together (a nice circuit board would make it more professional), a slight rewiring of the Megahertz switch and the DIN socket at the rear and you will be able to listen to all the available channels at one and the same time.

Bring to just below the boil (otherwise the ICs will self-destruct!), a pinch or so of solder and there you have it. What? You may well ask! Once the system is debugged by removing the link at the rear of the Kyokuto, and switching the Megahertz switch to 148, each and every channel between 144.000 and 147.990 will be selected, mute open condition detected and, if there is no signal, the next channel will be scanned.

Each 10 kHertz channel will be scanned at a rate of approximately 100 channels per 3 seconds. By inserting the aforementioned link, the device will only scan from 146.000 to 147.990. When a signal does appear, or the Phase Lock Loop becomes unlocked, the scanner will stop on this channel and sit there for about two seconds and then step on again. The device will stop on a signal so weak that it can't even be read as the Kyokuto will open the mute on a signal of approximately .15 micro-Volts.

To astute readers it will be immediately apparent that there is a tremendous possibility of improving on the functions and the features available but that can be left up to the individual. Suffice to say that this works and works well.

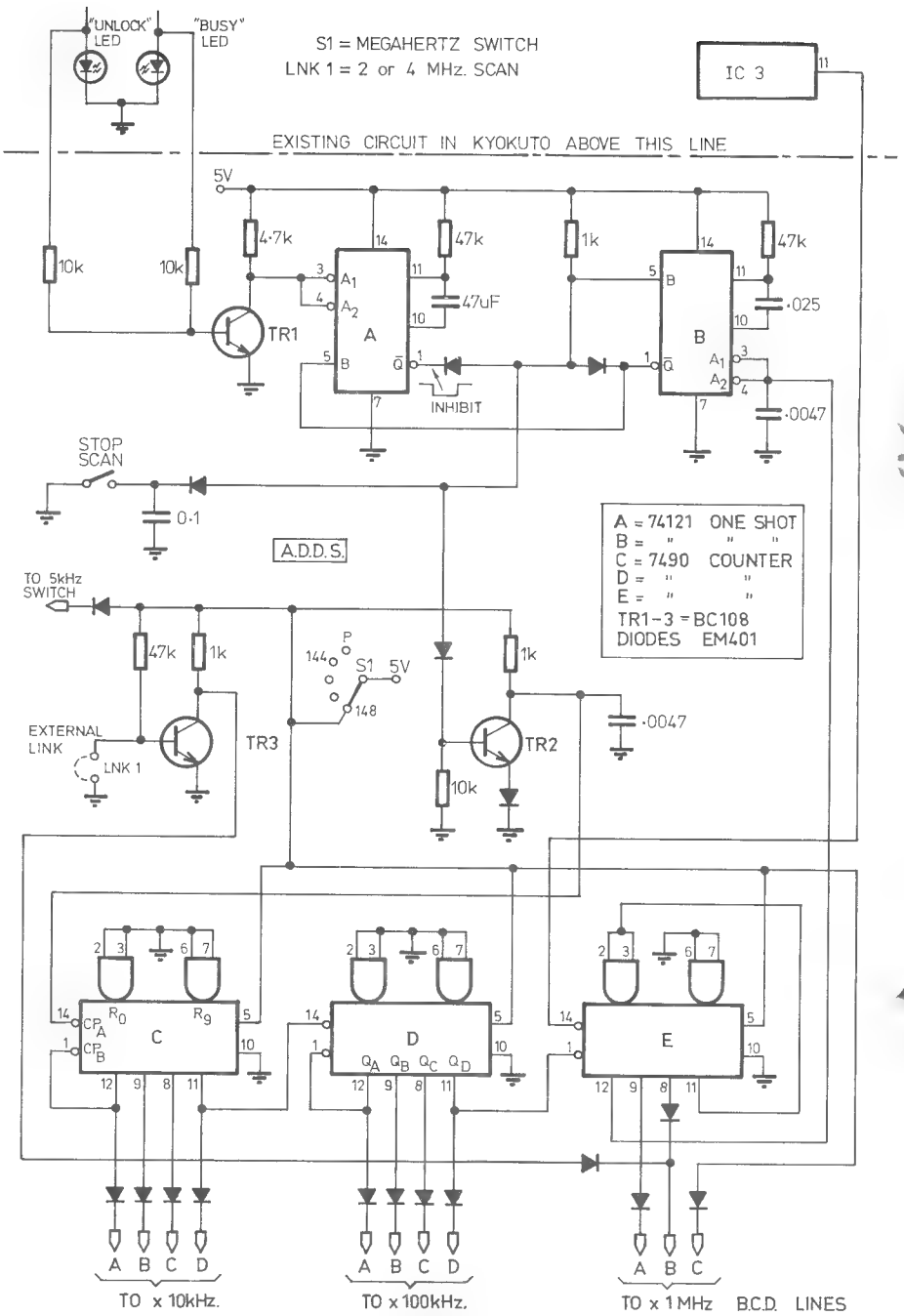


**FIGURE 1**

## CIRCUIT DESCRIPTION

The circuit is a fairly simple one, in that it uses easily available components. It is also very simple to construct on a small piece of Vero Board and added to the Kyokuto. It will fit near the speaker area.

Inside the Kyokuto is a PLL with one of the oscillators coming out at 1 MHz. This is divided down to 10 kHz and then fed into half of IC E. This is part of a divide by 10 counter. The output of this is 5 kHz which is fed into IC B, a one shot. This slows and shapes the pulse train, hereafter known as the clock pulse.

TR2 takes this pulse, subject to any of the INHIBIT functions, and passes it to the counting chain IC C. This chain drives the BCD lines which are strapped to the existing BCD lines coming from the manual switches on the front of the set. Thus the channel select data on the BCD lines is incremented 1 channel per clock pulse.

IC C feeds the X10 kHz lines, IC D handles the X100 kHz leaving the other half of IC E to look after the X1 MHz lines. The astute reader will notice that the output of IC E is different to the other two, but there is a good reason for this. The X1 MHz needs only to change from 144 to 147 and, if you looked at a truth table of a BCD counter, you would find that it is only the A and B value that changes with C staying high. The reason for the extra diode on line B of the X1 MHz lines is simply

to override the counter when the link is inserted to give a selection of 2 MHz only. TR3 is there purely as a logic inverter as I did not like to have full 5V rail external to the set where it could short.

Two important points to take note of. It is very important to remove all links and the diode from the 148 MHz position on the *Meg* switch so as to disable the BCD manual switches. Because of this, the 5 kHz LED now has no voltage to it so it would be floating between 0 and 5. This is overcome by the additional diode.

The inhibit functions mentioned earlier are provided by IC A, another one shot. TR1 is once again only a logic inverter and this enables the one shot whenever the PLL circuit gets out of Lock or when the mute open LED comes on denoting a busy channel. Another point worthy of note is that the mute setting becomes critical, if it is set too tight, the scanner will be sampling the next channel before it has decided if the previous channel was in use or not! If too loose, it will stop on every channel for 3 seconds.

**OPERATION**

In the author's case, the stop scan switch is actually the on-off power switch of the radio. The 2 or 4 MHz selection is done by using a DIN plug with a link and re-wiring the DIN socket on the back. And the whole thing starts by switching the radio to the 148 MHz position! Now for the good bits! When in the scan mode, each and every channel (at 10 kHz spacing) is sampled, mute open condition tested, and if nothing, it will step on to the next channel. At a rate of doing 200 channels per 7 seconds, or 400 in about 14 seconds. If, however, a channel is busy, the scanning will stop, let you read the frequency and decide if you wish to stop it or not, then it will step on to the next channel.

However, a word to the wise. No set is capable of 10 kHz separation, so if the input signal is very high, as from a repeater, then it is highly probable that it will stop (because the mute opens) about 10 or even 20 kHz before and after the correct channel. Not to worry, even with a permanently open mute, it will step on at approximately 10 kHz every three seconds. Have fun. ■

# THE NSW RTTY GROUP

S. E. Molen VK2SG

**With the increased number of Teletype machines becoming available throughout Australia, there has been an upsurge of interest in RTTY, this has been reflected in the increased number of stations on the air using this mode of transmission.**

Unfortunately with this increased activity, there have been a number of misleading articles in various magazines, giving inaccurate information to their readers, mainly in the areas of speed and frequency shift.

The international amateurs' standards are speed 45.45 bauds, and the shift is 170 Hz. These are the amateur standards, and not necessarily the commercial standards, which have a wide variation, depending upon the type of service that it is used for.

The NSW RTTY group has been conducting a weekly news transmission for the past seven months under the call sign VK2SG, but they have now been allotted their own call sign of VK2TTY; this call sign will in future be used for all official broadcasts of the NSW RTTY group. The transmissions have been taking place on the frequencies of 7045 and 14090 kHz every Sunday morning, and will continue on these frequencies in the future, with the addition of an evening transmission of 3545 kHz. The morning transmissions are at 0300 UTC and the evening transmissions are at 0830 UTC; we feel that in this way we can spread the news on RTTY to a greater number of people and help a lot of people getting their RTTY gear going correctly.

The NSW group has been allocated two RTTY repeaters, one of which will be at Dural and the other will be in the Newcastle area. The call sign will be for Dural VK2RTT, and for Newcastle VK2RYY.

In their efforts to assist the growing number of interested RTTYers the group has produced demodulator boards for the ST6; these are available from the NSW group, either as the bare boards or as a kit of parts, and will be supplied to any person who writes to the secretary requesting them. The kits comprise of the bits and pieces to build the demodulator but there is no power supply or chassis, as we think that most people will be able to provide their own 12 volt supply that will do the job, and therefore we are able to keep the price down to about 40 dollars.

Stemming from the interest in RTTY the NSW group has suggested that an RTTY section be included in the VK/ZL contest, the suggestion is that it be on the weekend of the phone section of the contest as this will not cause any interference to the CW part of the contest, and as a prelude to the suggestion we have asked numerous RTTY contest committees throughout the world for their comments on the proposed rules. In reply we have had an overwhelming agreement to the contest, and we hope that it will be a great success, if the VK/ZL contest committee agrees to its inclusion.

The RSBG RTTY station GB2ATG has been carrying out tests on 14 MHz in preparation to starting their world-wide broadcasts of news from Great Britain; the time of the broadcasts will be 0830 UTC and the frequency will be 14090 kHz; reports would be appreciated on these transmissions.

On the 24th to the 27th March will be the RSGB RTTY Spring contest.

If you are getting an interest in RTTY as a special mode of transmission and you need information about how to go about getting going, write to the Secretary of the RTTY Group, 14 Atchenson Street, Crows Nest, Sydney, NSW. We now have about 135 members in the group, and will be happy to accept more; it costs nothing to join and you do not have to live in NSW or be a member of the WIA, just write to us and indicate that you are interested and we will help you if we can. ■

# TRY THIS

WITH THE TECHNICAL EDITORS

**HAM M ROTATOR REPLACEMENT CAPACITOR**

This circuit replaces the 130μF AC electrolytic in Ham M and Ham II rotator control boxes. Motor torque suffers as the capacitor ages. The steering diodes obviate the need to obtain a special AC capacitor.

G. Scott VK3ZR,
Len Greaves VK3BGM ■

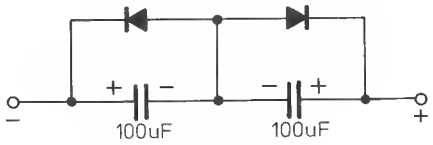


**FIGURE 1**

# QSP

**WANTED**

Photographs of your activities for inclusion in this magazine. Please don't forget captions. Send to Editor, AR, Box 2611W, GPO, Melbourne, Vic. 3001.

**DIGITAL COMMUNICATIONS**

An interesting article in the Aug. '77 issue of the Telecommunication Journal traces the development of source rates, bit by bit, from the 5-10 bit/s in 1850 when the Morse telegraph key came into operation, through to teletype as high as 30 bit/s early in this century, computer-related source rates of 4800 bit/s in the 1950/60s, vocoder at 32000 bit/s to digital video at speeds up to 80 million bit/s. The capacity of ma,or telecommunications facilities has doubled every 5 years over the last century. Digital transmission techniques currently used on the INTELSAT system use phase shift keying (PSK) closer to the technical limits theoretically possible for the efficiency of information transmission (Shannon's Law) but further studies continue. "Digital transmission" is defined as the conveyance of information of any nature between two points by means of discrete, as opposed to continuous, signals. Digital transmission in carrier or radio systems implies that the signal modulating the carrier is discrete. Another interesting definition is for Digital speech interpolation (DSI) being a process utilizing digital techniques in which the pauses in the conversation between two parties are used to carry the transmission between two other parties.

YAESU

bail

# A wish come true . . . from Yaesu to you — the FT-901DM

The combination of rejection tuning, variable IF bandwidth, and audio peak frequency tuning (APF) makes such accessories as a CW filter unnecessary. Any or all of the three systems may be used to enhance reception: the WIDTH control varies the width of the IF passband, the rejection tuning will null out a particular interfering signal within that passband, and, on CW, the APF control may be adjusted to emphasize the desired signal.

Digital and analog frequency readout plus memory circuitry make for the ultimate in versatility and operating efficiency. The memory unit will control the transmit, receive, or transceive frequency, as desired. For example, if you are on a net and must QSY to pass a piece of traffic, just store the net frequency in memory, and when you've finished with the message on the other frequency, just press a button for instant return to the net!

The Curtis 8043 IC keyer chip was designed for amateur radio applications. It provides such intangible qualities as immunity from RF interference and false keying due to key contact "bounce." The inclusion of the 8043 IC keyer provides relief for the DX-peditioner, too, as it eliminates the need for a separate electronic keyer (and the power transformer to make the keyer work on unfamiliar voltages).

The built-in RF speech processor increases your average talk power by 6 dB, by filling in "holes" in your voice. The processor accomplishes this average power increase without an accompanying increase in distortion, and it gives you that extra "boost" you may need in a tough pile-up.

Purity of emissions is important, both legally and ethically. The new FCC regulations regarding spurious emissions put tough demands on design. But even more important is your reputation, which can deteriorate quickly if you transmit distortion products across the band and harmonics that can cause TVI. YAESU engineers have included such features as a built-in low-pass filter, toroidal output circuitry, and RF negative feedback for a clean signal.

If you think the transmitted signal is clean, just look at the internal construction! Computer-type plug-in circuit boards make servicing a breeze, because a service technician can perform voltage tests and other measurements using an "extender" board, thus saving valuable time (and your service dollar!) that might be wasted unsoldering components from deep inside the chassis. The plug-in board concept also reduces point-to-point wiring, resulting in a clean, compact transceiver.

Some transceivers have WWV reception but no 160 meter capability; others have 160 but no WWV or crystal calibrator. All these features — full band coverage plus a 25 KHz crystal calibrator — are standard equipment, not costly "extras."

For the traveller, the FT-901DM offers unparalleled convenience. In addition to the built-in electronic keyer, the FT-901DM has provision for operation from a variety of AC voltages from 100 to 234 volts. Thus, no heavy, bulky transformer is needed. In addition, a DC-DC converter is built-in, for operation from your boat, car, or mobile home. Small enough to qualify as carry-on baggage on most airlines, the FT-901DM is equipped with a strong side-mounted handle for ease of carrying around airports.

Human engineering is a factor often taken for granted. It means more than just fancy or convenient gadgets incorporated in design; it also means placement of controls in a logical manner so that you won't have to fumble around looking for a knob when you need it quickly. It also means protective devices to make it difficult for you to damage your radio: in the FT-901DM, the "TUNE" switch has a 10-second timer which automatically returns the transceiver to the "receive" condition after 10 seconds of tuning, making it impossible for you to walk away from your transceiver while it is "key down." You'll find the FT-901DM to be the most convenient, most carefully engineered rig you've ever used.

Weak signals can often become buried by noise to the point where they are inaudible. The advanced noise blanker in the FT-901DM provides a significant improvement in signal-to-noise ratio in situations of impulse-type noise.

The FT-901DM brings you the state of the art in advanced features. Whether in the heat of competition or a casual ragchew, you'll be proud to own the exciting FT-901DM — from YAESU.

## Features

* Unique receiver filtering system with rejection tuning, dual-filter variable-width IF bandpass tuning, and a variable audio peak control for maximum selectivity.
* Built-in Curtis 8043 IC Keyer, which provides excellent immunity from RF interference. Eliminates the need to bring along a separate keyer while travelling. Semi break-in with sidetone.
* Advanced noise blanker for elimination of noise spikes.
* Digital readout utilizing bright LED's. Memory system allows you to store any transmit or receive frequency, then recall it with a flick of the switch. Ideal for net operation, multiplier hunting during contests, etc.
* RF speech processor for increased talk power.
* Rugged 6146 final tubes, toroidal output circuitry, and RF negative feedback for maximum reliability and purity of emissions. PLL frequency generation for state-of-the-art stability.
* 25 KHz crystal calibrator and +5 kHz clarifier for transmit and receive frequencies.
* Built-in VOX with front panel gain control.
* Selectable AGC system: SLOW-FAST-OFF.
* Built-in speaker.
* 180 watts DC input for SSB/CW, and 80 watts for AM/FSK/FM.
* Choice of supply voltages 100/110/117/200/220/234 plus DC-DC converter for 13.5 VDC for mobile.
* Compact size, light weight.

## Specifications

**GENERAL**

**Frequency range:** 160m 1.8—2.0 MHz, 80m 3.5—4.0 MHz, 40m 7.0—7.5 MHz, 20m 14.0—14.5 MHz, 15m 21.0—21.5 MHz, 10mA 28.0—28.5 MHz, 10mB 28.5—29.0 MHz, 10mC 29.0—29.5 MHz, 10mD 29.5—29.9 MHz, WWV 5 MHz (receive only)
**Power requirements:** AC 100/110/117/200/220/234 V, 50/60 Hz, DC 13.5 V, negative ground
**Power consumption:** AC 117 V—70 watts receive (45 watts HEATER OFF)—320 max watts transmit, DC 13.5 V—5.0 A receive (1.1 A HEATER OFF)—21 A max transmit
**Size:** 342(W) x 154(H) x 324(D) mm
**Weight:** 18 kg

**TRANSMITTER**

**Emission:** LSB, USB (A3j), AM (A3h), CW (A1), FM (F3), and FSK (F1)
**PA input power:** A1, A3j—180 watts DC, A3h, F3, F1—80 watts DC
**Carrier suppression:** Better than 40 dB
**Unwanted sideband suppression:** Better than 50 dB @ 1000 Hz
**Spurious radiation:** Better than 40 dB below rated output
**Transmitter frequency response:** 300—2700 Hz (—6 dB)
**3rd order distortion products:** Better than 31 dB below rated output
**Stability:** Less than 300 Hz drift from a cold start; less than 100 Hz drift over a 30 minute period after warm-up
**Negative feedback:** 6 dB at 14 MHz
**Modulation type:** A3j—balanced modulator; A3h—amplitude modulation of a low power stage; F3—variable reactance frequency modulation, maximum deviation ±5 KHz
**Antenna output impedance:** 50—75 Ohms unbalanced
**Microphone impedance:** 500—600 Ohms (low impedance)

**RECEIVER**

**Sensitivity:** 0.25 uV for S/N 10 dB
**Image rejection:** 1.8—21 MHz—better than 60 dB, 28 MHz—better than 50 dB
**IF rejection:** Better than 70 dB
**Selectivity:** WIDTH control at "0" SSB —6 dB: 2.4 KHz, —60 dB: 4.0 KHz; CW/FSK (with optional CW filter installed) —6 dB: 0.6 KHz, —60 dB: 1.2 KHz; AM (with optional AM filter installed) —6 dB: 6 KHz, —60 dB: 12 KHz; FM —6 dB: 12 KHz, —60 dB: 24 KHz
**Passband tuning:** Continuous from 2.4 KHz to 300 Hz
**Cross modulation rejection:** Better than 80 dB immunity at 20 KHz off 20 dB input at 14 MHz
**Desensitization:** Better than 90 dB immunity at 20 KHz off 20 dB input at 14 MHz
**Audio output:** Better than 3 watts @ 10% THD. Audio output impedance 4—16 Ohms

The Radio of Tomorrow Here Today

# FT-901DM Digital Readout HF Transceiver

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W. E. Brodie, Phone (02) 624 2691
**Newcastle** Digitronics, Phone (049) 69 2040
**Wagga Wagga** Rivercom, Phone (069) 21 2125
**Brisbane** Mitchell Radio Co., Phone (07) 57 6830
**Townsville** H. C. Barlow, Phone (077) 79 8179
**Canberra** Quicktronic, Phone (062) 81 2824

**Priced at $1575**

All prices include sales tax.
Freight is extra. Prices and specifications subject to change without notice. Allow 50¢ per $100 for insurance when freight required.

JAS7778-45

# "SHURE"

(MADE IN USA)

## Communications Microphone

MODEL 401A
High Impedance

**Price $31.50**
(Posted anywhere)

Model 401 Series hand-held communications microphones are compact size, CONTROLLED MAGNETIC R units designed for clear, crisp, natural voice response of high intelligibility.

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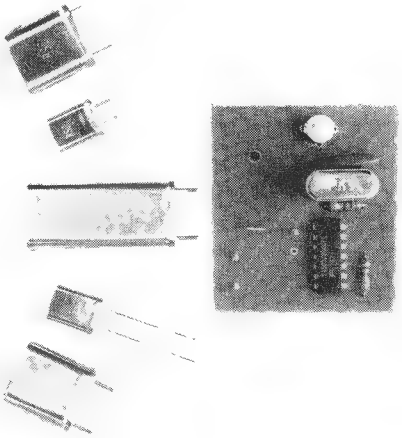

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GILCO

# AMATEUR RADIO CENTER

**23 WHITING STREET, ARTARMON, NSW 2064**
**TELEPHONE: (02) 439 1271**

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Q.: THINK YOU WERE SUCCESSFUL IN THE LAST EXAM?
Q.: HAVING PROBLEMS TRANSLATING THEORY INTO PRACTICE?
Q.: CONFUSED BY THE CLAIMS OF MANUFACTURERS?

THEN COME AND TALK TO US!

We have a wide range of radio equipment suitable for your operating requirements. We have the know-how to assist you in setting up a new station or updating your existing equipment whether you QTH is: A CITY FLAT — A SUBURBAN HOME — ACRES OF COUNTRY SPACE.

Whatever your lifestyle, you can enjoy ham radio.

## SPECIAL — POWER SUPPLIES

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| 138/3 | 3A | 13.8V | Reg. Supply .... .... .... | P.O.A. |
| 138/5 | 5A | 13.8V | Reg. Supply .... .... .... | $55.00 |
| 138/10 | 10A | 13.8V | Reg. Supply .... .... .... | P.O.A. |
| 138/20 | 20A | 13.8V | Reg. Supply .... .... .... | P.O.A. |

These power supplies are ruggedly designed for Australian conditions. All ratings are continuous. Filtering is through computer grade capacitors.

WE ALSO MANUFACTURE TO YOUR SPECIFICATIONS.

## GILCO AMATEUR RADIO CENTER

**23 WHITING STREET, ARTARMON, N.S.W. 2064**
Prop.: JACK GILLHAM VK2DG

SOCIAL RESPONSIBILITY: We reserve the right to refuse sale of transmitting equipment to unqualified persons.

# 20 YEARS AGO

*Ron Fisher, VK3OM*

**MARCH 1958**

During the post-war years, disposals equipment was freely available to Amateur operators. This tempted many to construct transmitters that were capable of running well in excess of the licensed maximum power. The use of final tubes such as the 813 or 100th was commonplace. However, many of these amateurs found much to their embarrassment that Radio Inspectors were not in favour of such components. To take the regulations literally, a transmitter capable of 100 watts input had to blow up with 101 watts input. The Amateur Radio editorial for March 1958 however, explained that now these regulations had been relaxed and that high power components could now be used subject to a reasonable method of limiting the power to the licensed limit.

March AR 1958 saw the start of a series that was destined to become a classic. Amateur Television by E. E. Cornelius VK6EC. Part one described the camera chain and the sync generator. To go with the article, Eric produced a set of superbly drafted diagrams and circuits.

An article in the previous issue, Mathematical Considerations of SSB by John Albert Adcock VK2ACA, provoked some interesting technical correspondence. The SSB versus AM arguments were at their height about this time. Frank Hine VK2QL reported via his DX page that conditions had been good from time to time, but with short skip producing a high level of QRM. A feature of the page was a photo of KV4AA with his array of the latest Hallicrafters and Johnson gear.

Changes on Federal Executive announced for March 1958 include Bob Boase VK3NI taking over as Federal Secretary from Doug Bowie VK3DU and new Federal Councillor for South Australia, Rex Richards VK5DO. ■

# WIA CORRESPONDENCE

Commonwealth of Australia.
Postal and Telecommunications Department,
G.P.O. Box 5412CC,
Melbourne, Vic. 3001.

Reference: R34/4/29.

The Secretary,
Wireless Institute of Australia,
P.O. Box 150,
Doncaster, Vic. 3142.

Dear Sir,

Reference is made to your correspondence of 28 October 1977. The matter referred to is that concerning additional VHF amateur repeater channels.

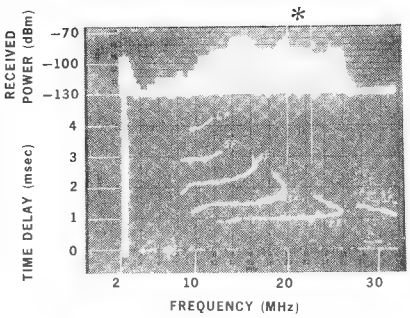
Thank you for the advice in this regard, no objection is raised to your proposal. Officers of this Department will be notified of the new arrangements accordingly.

Yours faithfully,
D. M. HUNT,
for Secretary.
23/2/78.

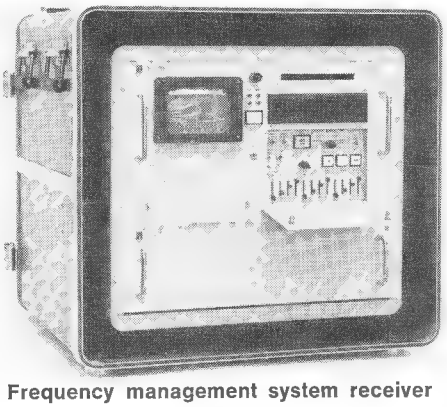
# AROUND THE TRADE

An HF frequency management system of great interest was recently tested in trials conducted by Datatel Pty. Ltd. for the Department of Defence. Extremely good and reliable communication was established by using this new equipment, Type AN/TRQ—35(V), which displays both actual propagation and frequency spectrum usage. This allows selection of an optimum frequency.

The system is in two parts. One of these is the spectrum monitor which displays usage of HF




**HF propagation display**



**Frequency management system receiver and display**

frequencies so that a frequency freed of interference may be selected.

The other part of the system is a type of ionospheric sounder called a chirpsounder, which provides a display of propagation over the circuit. This allows the optimum frequency for propagation to be selected.

The chirpsounder operates at lower power than a normal ionosonde so as to reduce interference to the circuit and allow its continuous usage.

Using this equipment, HF circuit reliability can be improved. Maybe HF is not dead and will enjoy a new lease of life for commercial and military usage and not be relegated to broadcasting, amateurs and over the horizon radar "woodpeckers".

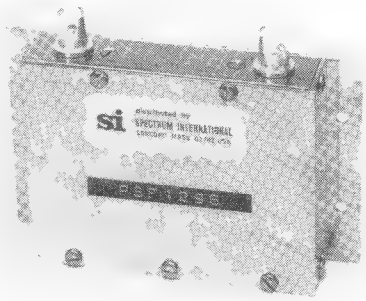
Further details may be obtained from Datatel Pty. Ltd., Suite 4, 3 Raglan Street, South Melbourne, who are the agents for the manufacturer, Barry Research of California.

**432 MHz LINEAR AMPLIFIER — MODEL EDL 432**

This modular amplifier, for the 432 MHz band, uses the 2C39A triode in grounded-grid configuration. The input drive power, 10 watts maximum, is compatible with most of the new 432 MHz transverters, transceivers and varactor triplers currently available. The modular style construction permits the owner to utilise his existing power supplies, etc., for maximum economy.

This linear amplifier is suitable for all transmission modes: CW, AM, FM, SSB, RTTY, fast and slow scan ATV, etc.

Further information is available from the manufacturers: Spectrum International, PO Box 1084, Concord, Mass. 01742, USA. Price is US$124.95 (freight extra, plus duty if applicable).




**BUILD IT YOURSELF ELECTRONIC EDUCATIONAL KITS**

Dick Smith Electronics has released a range of 15 very basic Electronics Kits designed for anyone who has an interest in using their hands to learn about electronics.

The Kits are packed in plastic hanger bags and contain all the bits and pieces to build a multitude of useful and interesting products. Even the wire and solder.

The Kits are battery powered so there is no worry about electronic shocks. They are easy to put together — all the tools that are used are a soldering iron, wire strippers and wire cutters.

The Kits are based on the Electronic Kits published in the book Project Electronics which sells for $4,75. The book is available from newsagents and book stands and contains all the instructions and helpful information on how to build all the Kits.

The Kits are inexpensive and would make an ideal present for anyone over 12 years of age or as an introduction to Electronics.

Among the range is:

| | |
|---|---|
| Two Tone Door Bell Kit | $4.00 |
| Heads and Tails Game | $3 50 |
| Morse Code Practice Game | $3.50 |
| An Electronic Sire Kit | $5.50 |
| A Simple AM Radio Kit | $6.50 |
| An Electronic Dice Game | $5.90 |

Plus eleven more.

The Kits are available from all Dick Smith "Electronics for the Enthusiast" Stores, in Sydney, Melbourne, Brisbane or Adelaide or any Dick Smith dealer. ■

# QSP

**A STEP BACKWARDS — RECIPROCITY**

The first part of the above is the title of the editorial in the Nov/Dec 1977 issue of Mobile News (Journal of Amateur Radio Mobile Society). As from 1-7-1977 the use and the possession of radio transmitting equipment without the required licence is an offence in the Netherlands. Registration stickers will also be issued to be affixed to all such apparatus. Travellers passing through Holland will therefore face difficulties if registration certificates and stickers had not been obtained prior to the visit. The editorial comments — "No doubt the increase in acts of terrorism and kidnapping in several European countries is making their authorities much more security conscious. Such acts require split second timing so a two-way radio is probably essential; hence the new requirement for sticking official labels on all the equipment as far as the Dutch are concerned. There could be another explanation. Most of us are conservative and tend to resist change. This seems to apply particularly to civil servants who suddenly find their routines upset by some new regulation. Could it be that this new Dutch licensing procedure is simply designed to deter would-be foreign applicants so as to cut the work load on some civil servants? There is evidence that other countries are taking a very long time to process reciprocal licensing applications, so that, unless one is able to plan a trip well in advance, it may not be possible to get the paper work through in time."

**10 GHz BAND**

Writing about 10 GHz operations in the radio amateur column in the Telecommunication Journal November 1977, G3RPE commented:—

"The maximum length of unobstructed path is limited by geographical factors; in the United Kingdom, to about 260 km under normal conditions. To go substantially beyond this while still using the simple equipment described above, amateurs have exploited the humidity ducts which form over water under certain weather conditions. The super-refraction observed has enabled paths up to 521 km to be covered. In some cases, the ducts appear perfect and, as a result, the path losses then fall well below even the free-space values. Under these conditions, signals tend to be very strong, for example, good signals from the United Kingdom were received in Belgium using only the open end of the waveguide receiver input. Amateurs' experience strongly suggests that these ducts are present much more often than had been anticipated." ■

# AMATEUR SATELLITES

*Bob Arnold*
VK3ZBB

**OPERATING NEWS**

It has been a little difficult for inexperienced operators of OSCAR 7 to keep up with the operating Mode changes, particularly during January and February. Due to battery temperature aboard the satellite, the conventional BBA sequence was changed to continuous B, but further overloading of this Mode in Europe caused automatic switching to Mode A without warning. It has, therefore, been necessary to monitor both Modes on every pass to determine individual operating procedures.

Despite these problems, operations have been at a high level and considerable satisfaction has been obtained from the high quality of communication attained on Mode B.

The popularity of the "Microwave Modules" series of transverters is making an impact on Mode B operations — the following new stations have been heard:—

VK2ZSL, ZAA; VK3BH, YFT, ZVV; VK5PF; VK6ZHM; ZL1BDU; ZL2TSH; VK1RC; WA8VDJ/KH6.

Notable contacts: VK4TL and VK4ZRF to WA8VDJ/KH6.

During January, the beacon of Stanford Research Institute satellite P75-5 was heard. Beacons are 435.97 MHz and 1239.0 MHz. The former beacon gives 5 x 9 signals but the latter is not reported as being heard.

The orbital parameters are: inclination 99.655°, period 105.729 minutes, longitude increment 26.43°, height 1025.968 km.

The satellite is sun synchronous and can be heard on one or more passes between 11 a.m. and 3 p.m. **LOCAL** time on South-North pass, and twelve hours later on North-South pass. For a more accurate calculation of the passes, the following information may prove useful:—

Date: 28 Feb. 78.

Equatorial Crossing: 0029 GMT.

Longitude: 194.05 degrees West.

The P76-5 beacon on 435.97 gives a useful indication of what to expect with Mode J operation (145.95 up, 435.15 down). The doppler effect is most noticeable and averages 20 kHz on an overhead pass. To follow the beacon requires almost continuous tuning of the receiver to hear the signal — we shall need yet another pair of hands for Mode J!

**PORTABLE OPERATION**

Graham VK5EU has sent me an interesting report, reproduced below, which shows how easy it is to make satisfactory OSCAR contacts using simple equipment and antennas. Graham writes — "During my holiday periods and in the course of my employment I have travelled extensively in VK2, 3, 5 and earlier in VK8. I have always wanted to set up a semi-permanent portable/mobile station, and this is the result.

Mobile antennas are ¼ wave verticals on 70cm and 2m, and a 6 ft. fibreglass car radio whip with a coil at its base to resonate it on 10m. Portable antennas are similar but 3-5m high.

A preamp on 10m is in most cases a necessity, and it certainly helps on 2m too — I use both.

Equipment used on 70cm was initially a rebuilt commercial transvertor at ½ watt PEP, later with a home brew 15W PEP amp. This was eventually relegated to the base station, and was replaced with a microwave modules unit at 8-9W PEP — much more compact.

The 2m exciter and receiver is an IC202 modified to allow USB and LSB operation for Mode B, with a 3N200 preamp on receive and amps to 30W PEP using a 2N5591 on transmit.

The 10m receiver and 70cm IF is an FT301S Preamp on 10m uses a 2N5245.

My best DX to date with portable is JR6AE in Okinawa, and while mobile is ZL, although VS3, DU6 and even KG6 should be OK mobile. Portable I have worked 43 different stations, including VK2, 3, 4, 5 and 6, ZL1 and 3, and JR6. Mobile I have worked 26 different stations, including VK1, 2, 3, 4, 5, 6, and 7, ZL1, 2 and 3.

Excellent results can be obtained with very simple equipment and antennas, but for the best results, look out for the details like preamps, noise blankers, feeder losses, etc. I will be looking forward to hearing you."

**SATELLITE PARAMETERS**

To assist listeners to and operators of the various satellites, I have tabulated the parameters of the known and anticipated satellites, as at February, 1978. Some of the information, particularly referring to the Russian Series, is a little vague and lacking in detail for long-term calculations of acquisition data.

I hope to update this information from time to time via Divisional Broadcasts or notes in this segment of AR, and will re-issue the Table periodically.

If any operators have suggestions to make or up-dated information, would you please let me know.

**INFORMATION SERVICE**

I have now received a supply of the following literature:—

- AMSAT Membership Application Forms.
- OSCAR in the Classroom.
- OSCAR for Beginners.
- Satellites make Ham listening more fun.
- OSCAR Phase III Sponsorship.
- Calculating orbit predictions. Reprint from Amateur Radio, October 1972.
- Morse Code Telemetry Reporting Forms.

If you would like a copy of one or more of these, please drop me a line and enclose 18 cents stamp (no phone calls, please). QTH is correct in all recent call books.

**ORBITAL PREDICTIONS — MAY**

| Orbit | Mode | Date | Time Z | Long. |
|---|---|---|---|---|
| 15814 | B | 01 | 0001 | 57.5 |
| 15827 | B | 02 | 0055 | 71.0 |
| 15840 | A | 03 | 0150 | 84.6 |
| 15852 | B | 04 | 0049 | 69.5 |
| 15865 | B | 05 | 0143 | 83.1 |
| 15877 | A | 06 | 0043 | 67.9 |
| 15890 | B | 07 | 0137 | 81.5 |
| 15902 | B | 08 | 0036 | 66.3 |
| 15915 | A | 09 | 0131 | 79.9 |
| 15927 | B | 10 | 0030 | 64.8 |
| 15940 | B | 11 | 0124 | 78.4 |
| 15952 | A | 12 | 0024 | 63.2 |
| 15965 | B | 13 | 0118 | 76.8 |
| 15977 | B | 14 | 0017 | 61.7 |
| 15990 | A | 15 | 0111 | 75.2 |
| 16002 | B | 16 | 0011 | 60.1 |
| 16015 | B | 17 | 0105 | 73.7 |
| 16027 | A | 18 | 0004 | 58 5 |
| 16040 | B | 19 | 0059 | 72.1 |
| 16053 | B | 20 | 0153 | 85.7 |
| 16065 | A | 21 | 0052 | 70.5 |
| 16078 | B | 22 | 0147 | 84.1 |
| 16090 | B | 23 | 0046 | [illegible] |
| 16103 | A | 24 | 0140 | [illegible] |
| 16115 | B | 25 | 0040 | [illegible] |
| 16128 | B | 26 | 0134 | [illegible] |
| 16140 | A | 27 | 0033 | 65.9 |
| 16153 | B | 28 | 0128 | 79.4 |
| 16165 | B | 29 | 0027 | 64.3 |
| 16178 | A | 30 | 0121 | 77.9 |
| 16190 | B | 31 | 0021 | 62.7 |

| | OSCAR 7 | OSCAR D | R-S | PHASE III | P76/5 |
|---|---|---|---|---|---|
| Launch Date | 15 Nov. 74 | Est. March 5, 78 | During 1978 Four Satellites | Est. Dec. 79 | |
| Inclination Degrees | 101.70 | 98.99 | 82 | 57 | 99.655 |
| Orbit Period Minutes | 114.945 | 102.790 | 102 | 11 hr. approx. | 105.729 |
| Orbit Increment Degrees | 28.736 | 25.697 | | | 26.43 |
| Apogee km | 1461 | 903.79 | 950 | 24249 | 1025.968 |
| Perigee km | 1450 | 877.86 | | 932 | |

| | | OSCAR 7 | OSCAR D | Russian Series | OSCAR Phase III | P76/5 |
|---|---|---|---|---|---|---|
| MODE A | UP | 145.85-145.95 RC | 145.85-14.95 RC | 145.80-145.90 | | |
| | DN | 29.40-29.50 L | 29.4-29.5 L | 29.30-29.40 | | |
| MODE B | UP | 432.125-432.175 LC | | | 435.150-435.290 | |
| | DN | 145.925-145.975 Inverted LC | | | 145.850-145.990 Inverted | |
| MODE J | UP | | 145.90-146.00 LC | | 145.850-145.990 | |
| | DN | | 435.10-435.20 Inverted L | | 435.150-435.290 Inverted | |
| BEACONS | | A 29.502 L<br>A 435.10 RC<br>B 145.972 LC<br>2304.1 LC | 29.402 L<br>435 095 L | | 145.995<br>435.145 | 435.970<br>A0 Modulation<br>No communication |

Polarisation for Southern Hemisphere:
L — Linear. LC — Left hand Circular. RC — Right hand Circular.

# AWARDS COLUMN

*Brian Austin, VK5CA*
P.O. Box 7A, Crafers SA, 5152

**WAVKCA (VHF)**

Certificates have been posted to the following: VK3AQR, VK3ZNJ, VK3ZGP, VK3AMK, VK3AOT, VK4ZWW, VK3BFG, VK3ZAZ, VK2HZ, VK3KK.

**WORKED ALL QUEENSLAND AWARD**

1. This award is divded into two sections:
   Worked All Cities and Towns.
   Worked All Shires.
2. Any transmitting amateur or listening amateur may apply for this award, provided that these applications comply with the rules.
3. Only one award is issued, but this will be updated upon receipt of further additions.
4. Worked All Cities and Towns: There are 20 incorporated cities and towns in Queensland. Initial award: 15 contacts with radio amateurs operating from these cities and towns. A "silver sticker" if ALL cities and towns are worked.
5. Worked All Shires: There are 111 shires in Queensland. For this award, 1976 listing is considered to be the correct one. The population figures in these shires range from 250 to well over 25,000. Initial award: 51 contacts.

"Stickers" for 61, 71, 81, 91, 101 shires, with a gold sticker if ALL shires have been contacted.

6. Modes and Bands: All legitimate modes and bands may be used, MF, HF, VHF, UHF, OSCAR, EME, etc., but cross-band modes are not allowed.
7. Special VK Rules: As a number of areas are not very active, "DX-peditions" to these areas are encouraged to help the award hunter and others to get that rare Queensland Shire, Town or City. The following will apply:
   (a) The Queensland Awards Manager or his appointed delegate shall be advised in writing of the intended VK/portable operation in those areas which are not too active or are non-active. If the approximate dates of operation are available, advanced publicity could be given and you may become a much sought-after "rare DX-station".
   (b) A copy of the VK/P log shall be forwarded to the Queensland Awards Manager for use as a check list. The VK/P operator will automatically be credited with "as having worked" that particular area, if
      (i) at least 50 contacts are made with a minimum of 4 VK calls areas, or
      (ii) at least 30 overseas contacts are logged.
8. Method of application: A certified list of contacts, as per CHC rules, to be sent to —
   The WIA (Queensland) Awards Manager, G.P.O. Box 638, Brisbane, Qld. 4001, Australia, with either $1 (Aust.) or 10 IRCs or equivalent for the initial award. Subsequent stickers will be issued free, although return postage will be appreciated.
9. Contacts made as from 1-1-1976 will be valid for this award.

A list of the Cities, Towns and Shires can be obtained from the WIA, Brisbane. I would suggest you enclose a s.a.s.e. with your request.

**REDCLIFFE CITY AWARD**

Readers are reminded that the time to try and get this award is every Sunday evening at 1000 hrs. GMT. The Redcliffe Radio Club station VK4RC will call the RRC Net on approximately 14.295 to 14.300 MHz (depending on QRM). Anyone interested in this award should check in. At times it is possible to acquire the necessary point score in "one sitting", at other times it may require a few more check-ins.

VK and ZL stations require a total of 6 points to qualify, others require 4 points. VK4ARC, the Club station, carries a 2 point score, RRC members count as 1 point.

All one has to do to apply for the award is —

1. List the stations worked, giving time, date, frequency, mode, report and operator's name.
2. Forward this list with either 2 IRCs or 50c Australian in mint condition to:
   Redcliffe Radio Club Awards Manager,
   P.O. Box 20, Woody Point, Qld. 4019.

No QSL cards are required, but will be welcomed. Redcliffe cards will be sent through the normal channels to the stations contacted. However, for this award the list as under 1. is the only requirement.

Please note that wherever enough interest is shown, the Club net may QSY at 1030 GMT to 28.550 MHz or 3.650 MHz or thereabouts for the VK4Ns. During the winter months the net is usually held on 3.680 MHz ± but this will be announced on the WIANEWS.

It is reported that distinctive prefixes such as KG6 and KV4 are being discontinued for various Pacific and Caribbean islands. Instead of their present unique prefixes, all Pacific area US amateurs will be issued KH6 calls while those in the Caribbean will receive KP4 prefixes. Present holders of calls with the discontinued prefixes will, however, be permitted to retain them indefinitely — the change applies only to new applicants from those areas. The prefixes involved include KG6, KS6, KB6, KJ6, KM6, KP6, KW6, KV4 and KC4 (Navassa). The reasons for the change include freeing up a large number of amateur call signs for future amateur growth and reduction of the processing burden. ■

# BOOK REVIEW

**MAINTENANCE SERVICE MANUAL FT101 SERIES**

Here it is — all you ever wanted to know about the FT101, but didn't know where to ask.

This comprehensive book has been produced in the United States by Bernard E. Tower W6RNW, General Manager of Yaesu Electronics, USA.

The 226 pages are divided into eight sections which cover in turn, general information including history, tune up, soldering, theory of operation and compatible Yaesu accessories.

Section two has operating information. Three covers assembly and interconnection with details on removal of the front panel, VFO, plus details of connecting the various accessories. Included in this is an interesting modification to provide increased output from the IF OUT socket to give adequate deflection on the YO-100 scope when used for receive monitoring. Part four covers fault finding including voltage and resistance charts. Part five has a full run-down on board and parts location including schematic diagrams. Modifications are treated in part six and these include installation of the RF processor into the late 101 and 101B series, noise blanker modification, FSK operation plus many more. The last two sections cover alignment and parts lists.

Overall the book does an excellent job of covering an enormous subject. However, owners of the very early 101s would be disappointed in the very limited coverage given to these sets.

Unfortunately, information of this type does not come cheaply. The current price is $30 and it is possible future supplies will be even more.

It is, however, highly recommended to all FT101 owners who want to know more about the way their transceiver works.

Further details from Vicom International, 139 Auburn Road, Auburn. ■

# VKCB CLUB

**REPORT ON ACTIVITIES — AUGUST 1977 TO FEBRUARY 1978**

**MEMBERSHIP**

Those not holding an amateur's licence are required to complete a total of 5 hours of training at a club course organised for prospective new members. (A step by step outline of this course is available.)

**ASSISTING THOSE ENQUIRING ABOUT AMATEUR RADIO**

The use of the club call sign "amateur radio" continually attracts enquiries as to what amateur radio is and how one can become a ham. VKCB members handle enquiries received on 11 metres as follows: (1) THOSE ABLE TO ATTEND SATURDAY AFTERNOON COURSES — are encouraged to attend the weekly novice amateur licence course at the WIA. (2) THOSE UNABLE TO ATTEND COURSES — are told to (a) write for the $15 novice YRS study package, (b) obtain the book "From 5 to 1000 watts", $2.95 from Tandy Electronics, (c) pick up the amateur regulations booklet for $1.65 from P. & T.

**FRICTION FREE INTERACTION WITH THE CRS**

Has been achieved through the aims and spirit of the club which outlined constitutionally are —

(1) To provide an opportunity for those interested in the hobby of amateur radio to contribute to the development of the citizens, radio service, particularly in assisting the newcomer by way of —
(a) providing an example of good operating practices, and
(b) by providing technical on air assistance in relation to interference problems and station maintenance.

(2) To encourage and assist interested fellow CB operators who would like to obtain the novice amateur radio transmitting licence.

**AMATEUR RADIO'S RESPONSIBILITY IN RELATION TO PIRACY**

The radio hobbyist should be given a friendly hand into amateur radio before he or she gets caught up in the ideas of modifying their CB, building beams, adding linears and using any frequency one desires. Such a state of affairs does not benefit either service. Within CB the first step is to know that a hobby called amateur radio exists, the second is to offer an opportunity to get involved in the hobby, and the third step is to become sufficiently enthusiastic so as to personally commit oneself to studying for the amateur licence. As the CB user becomes interested in radio as a hobby the VKCB club members are able to direct the energies of such enthusiaists in the right direction.

**AFFILIATIONS**

The VKCB club is closely associated with the WIA, the NCRA and the YRS. During the December-January vacations some 125 people were attracted to the 6 week novice course. Over 90 per cent indicated that they were CB users. Many had heard VKCB club announcements about the course being broadcast regularly on the AM and SSB call channels on their CB radios. As a result of these activities a somewhat exceptional number of 50 applications for WIA membership was received by January.

At the NCRA State meeting at Bathurst in February the VKCB club introduced some 200 people representing CB clubs around NSW to amateur radio. Displays of inexpensive home made rigs and kits for the new novice as well as WIA log books, AR magazines, were well received, as were several novice study kits. Arrangements were made to speak at several CB clubs as well as get novice courses going within the clubs. The next NCRA State meeting will be at Port Macquarie in May, where the VKCB club will conduct another amateur introduction session.

**11 METRE ON AIR VKCB CLUB ACTIVITIES**

Guide to VKCB club members.

Channel 6 (new) 11 (old) AM LISTENING (VKCB members QSY to old 14 when possible).

Channel 10 (new) 14 (old) VKCB CLUB AM QSO CHANNEL and hand held.

Channel 12 (new) 16 (old) LSB LISTENING (VKCB members QSY to old 19 when possible).

Channel 15 (new) 19 (old) VKCB CLUB USB QSO CHANNEL.

**THE SYDNEY 11 METRE NOVICE STUDY COURSE ON THE AIR**

In this VKCB club net, the net controller asks a novice exam question and each CBer in the net selects the correct answer from the alternative. Then the controller reads the question again and gives the correct answers with explanations.

VKCB club net runs almost daily on old 14, using AM from 8 p.m. often till 12 or 1 a.m. New CBers breaking in are always made welcome.

The EASTERN SUBURBS VKCB NET operates each SUNDAY at 7.30 p.m.

Novice and CB news each Sunday at 11 a.m. and 7.30 p.m. on old 22 USB.

**80 METRE VKCB PARTY MONTHLY NET**

1st Friday of each month 7.30 p.m. from 3.560 to 3.573 MHz. CBers are invited on the air to attend these parties to find out more about the VKCB club and amateur radio.

**VICTORIAN DIVISION OF THE VKCB CLUB**

Co-ordinator, Mark Stephenson, 43 Cuthbert St, Reservoir, Vic. 3073. (03) 460 1615.

**N S.W. PRESIDENT AND NATIONAL CO-ORDINATOR**

Sam Voron, 2 Griffith Ave., East Roseville 2069. (02) 407 1066. All enquiries welcome, via letter, on 80m or at week-end seminar radio. ■

# QSP

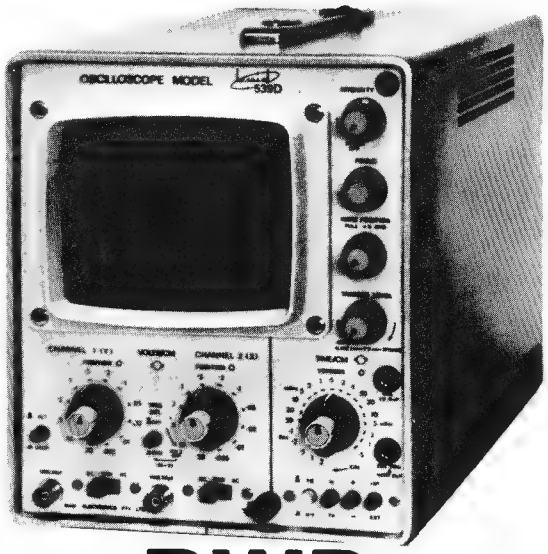
**VICTORIAN NOVICE LICENCE — TRIAL EXAM**

In order to help all actual and prospective candidates for the Novice Amateur Licence, the Youth Radio Clubs Scheme (Victorian Division) will hold a Trial Novice Examination on Saturday, April 15, 1978. The place of examination will be near the central area of Melbourne and will be easily accessible by public transport. Parking will be available.

The exam fee is $1.00 and should be sent with your application as a postal note or a cheque made out to the Youth Radio Clubs Scheme; please DON'T send cash. The fee should be included with a note containing your:
Surname and initials.
Postal address (in full, including postcode).
Telephone number (if none, write "nil").

Applications should be posted to:
YRCS Trial Novice Exam,
11 Vista Avenue,
KEW, Vic. 3101. ■

# 25 MHz Bandwidth

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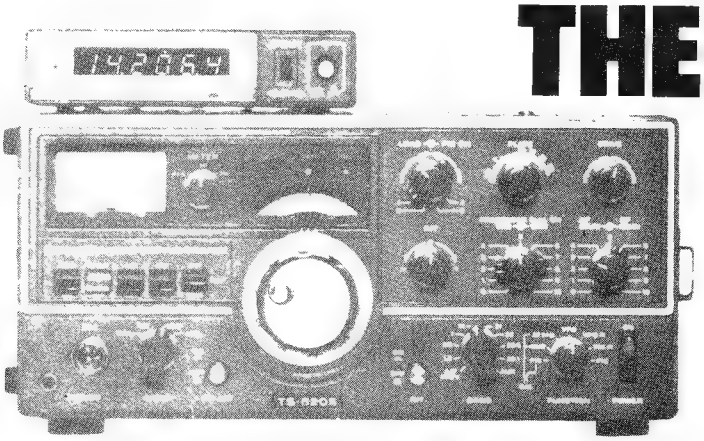
| QLD. | Warburton Franki (Brisbane) Pty. Ltd., Phone 52 7255 |
| S.A. | Protronics Pty. Ltd., Adelaide. Phone 51 4713 |
| | Rogers Electronics, Adelaide. Phone 42 6666 |
| W.A. | Cairns Instrument Services, Perth. Phone 325 3144 |
| TAS. | Associated Agencies Pty. Ltd., Hobart. Phone 23 1843 |

# THE NEW TS 520S

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A NEW STANDARD IN ECONOMY TRANSCEIVERS
Full coverage 1.8 to 29.7 MHz * Outstanding Receiver Sensitivity and Minimum Cross Modulation * Vernier Tuning for Plate Control * Highly effective Noise Blanker * New Improved Speech Processor * RF Attenuator *Easy connection to Phone Patch * Fully compatible for optional 6-Digit Read-out * Price: TS 520S **$685**

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The pacesetter, provides superior performance, versatility and features found in no other Transceiver $1100

KENWOOD TR 7400A FM VHF TRANSCEIVER
Full 4 MHz coverage, 25 watts high, 5 to 15 watts low, offset for Repeater. Fully synthesised, 6-Digit Read-out PRICE **$425**

KENWOOD TS600 VHF TRANSCEIVER
Matching in size and performance to the TS700A, coverage 50 to 54 MHz. SSB/FM/AM/CW. PRICE **$650**

| | | |
|---|---|---|
| ICOM MODELS | IC – 22S | PRICE $265 |
| | IC – 245 | PRICE $440 |
| | IC – 245 (with SSB adaptor) | PRICE **$550** |
| | IC – 211 | PRICE $750 |
| YAESU MODELS | FT 101E | PRICE $850 |
| | FL – 2100B Linear | PRICE **$565** |
| | FT – 301S – FT – 301D – FRG7 | |

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# See You Upstairs!

NEW RELEASE

MMT432/144'S' Transverter, featuring 2 switchable ranges. 432 – 434 434 – 436 MHz, input frequency 144 to 146 MHz.

Get away from the maddening crowd below. The MMT432/144'S' 434 Linear Transverter will get you there. This solid state linear made transverter allows you to operate your 144 MHz SSB, AM, FM or CW units at 432 MHz .... up where there still aren't a lot of people. Amateur Electronic Imports is the exclusive Australian distributor for this precision British made unit from Microwave Modules, Ltd.

NEW RELEASE for OSCAR 8 down link – 70CM converter model MMC434/28, coverage 434 to 436 MHz. PRICE $51

TRANSVERTERS Model MMT432/28 S, coverage 432 to 436 Price $245
TRANSVERTER Model MMT144/28 coverage 144 to146 MHz Price $185

Our extensive range includes: Converters MMC432/28–432/144 Price $51 144/28 Price $45, 144/28LO and 52/28LO Price $49, MMC1296 and 1296/144 Price $65, Varactor Tripler MMV1296 Price $74, 500 MHz counter MMD050/500 Price $175, MMT Power supply $94.

SPECIFICATIONS:
Frequency coverage: 432–436 MHz.
Input frequency range: 144–146 MHz.
DC power requirements: 11-13 volts (12 volts nominal).
Current consumption: 250 mA quiescent 2.1 Amps peak.
RF connectors: 50 ohm BNC sockets
Power connector: 5 pin DIN socket
Size: 187 x 120 x 53 mm
Weight: 900 grams. PRICE $ 295

All prices subject to change without notice.
Onwards forwarding please add sufficient for freight or postage. Excess will be refunded.

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## NEW-NEW-NEW

**National** ***RJX SERIES***

RJX-S1011 RJX-1011 RJX-V1011

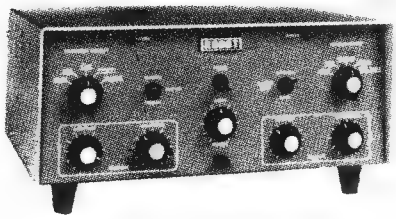
## A Unique New SSB/CW Transceiver For Amateur Communications

There is no substitute for quality, performance, or the satisfaction of owning the very best. Hence, the incomparable National RJX-1011 amateur transceiver. The RJX-1011 covers all amateur bands 1.8-30 MHz (160-10 metres). It utilizes advanced Phase-Lock-Loop circuitry with dual gate MOS FETs at all critical RF amplifier and mixer stages. There's a rotating dial for easy band-scanning and an electronic frequency counter with digital readout and a memory display that remembers frequencies at the flip of a switch. And that's just the beginning. Matching speaker unit RJX-S1011 and complete external VFO RJX-V1011 also available.

For further information and specifications write, phone or call in!

**ANNOUNCING DIRECT FROM USA** **Wilson's SYSTEM ONE**

**TRIBAND ANTENNA:** A DXer's delight, operating 20 m on a full 26 ft. boom with 4 elements on 20-15, and 5 elements on 10. Gain 10 dB!



## ORDER YOUR ROBOT MODEL 400 SSTV CONVERTER NOW!

With the Robot 400 you just plug it into your transceiver, connect a TV monitor or your home set with the optional Robot RF adapter kit, tune to 14.230, and you're operating SSTV.

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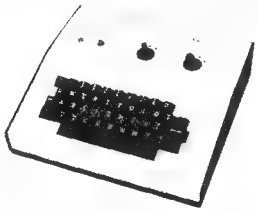
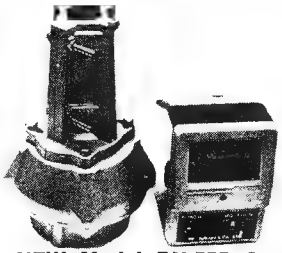


**New Model 75 RTTY TO VIDEO CONVERTER**

**Features:**
4 speeds (60, 66, 75, 100 wpm)
Biult-in T.U. with 3 shifts (170, 425, 850 Hz)
32 character x 16 line video output with scrolling
Connects directly to rceiver audio & video monitor

**New Model 150 RTTY KEYBOARD**

**Features:**
4 speeds (60, 66, 75, 100 wpm)
Built-in AFSK with 3 shifts (170, 425, 850 Hz)
Automatic CR & LF at end of 64 or 72 character line
Built-in low shoft CW ID provision



**NEW: Medium-Sized Ham Antenna Rotator — FU 400.**

Constructed for long trouble-free operation. 200 kg vertical weight capacity. Extra heavy duty disc brake that prevents wind-milling.

**NEW Model DX-555 Counter-Generator**

**Generator:**
440 kHz to 30 MHz in 3 ranges.
Output displayed on counter and available at jack on rear panel 600 Hz modulation for AM receivers.

**Counter:**
5 digit display, 7 digit readout capability. 10 Hz to over 30 MHz (250 MHz with prescaler). Input level 20m Vrms to 5 Vrms (Prescaler 200m Vrms to 2 Vrms). Base oscillator beats directly against WWV.

**NEW COUNTER-GENERATOR**
Two vital pieces of test equipment in one.

## LINEAR AMPLIFIERS

**SCS:** HF3-100L2, 3-30 MHz bi-linear amplifier.
**SCS:** 2M10-80L2, 144-148 MHz, FM/SSB linear amplifier.
**METRON:** MA1000, all solid state, 1 kW amateur band linear amplifier — lightweight, compact and rugged.
**YAESU MUSEN:** FL-2100B, 80-10m linear amplifier.

## ANTENNAS:

**HUSTLER:** 4-BTV — vertical trap antenna.
**HUSTLER:** Mobile vertical trap antenna (80-10m).
**HUSTLER:** G6-144A, 6 dB gain base colinear.
**HUSTLER:** CGT-144, 5.2 dB gain mobile colinear trunk-lip mt.
**HUSTLER:** BBLT-144, 5/8 mobile with trunk lip mount/spring
**CUSHCRAFT:** ATB-34, 4 element beam, 10-15-20m

## RF PREAMPLIFIERS FOR 3-30 MHz BAND:

**Model SX-59 for use with transceivers.**

SPECIFICATIONS:
Frequency range 3-30 MHz in 3 bands; 3-7, 7-14, 14-30 MHz
Gain 20 dB nom. (at 7 MHz), front panel variable control
Attenuator —20 dB attenuation selectable from front panel control.
Imped. 50 or 70 ohm systems, UHF connectors on rear panel.

Switching requirements: requires external relay contact switching when used with transceivers. Remote contacts readily available from most amateur HF transceivers, including TS-510, TS-511, TS-520, TS-820, FT-101, FT-401, FT-200 and FT-201.

## AMATEUR BAND TRANSCEIVERS:

**NEW — NATIONAL:** RJX1011 — Unique SSB/CW 160-10m transceiver with digital readout and matching speaker and external VFO.
**TRIO KENWOOD:** TS520S — SSB/CW, 160-10 metres, with optional digital readout.
**TRIO KENWOOD:** TS820S, 160-10 metres digital readout.
**TRIO KENWOOD:** TS820, 160-10 metres.
**TRIO KENWOOD:** TS700A — 144-148 MHz all mode transceiver.
**TRIO KENWOOD:** TS600A — 50-54 MHz all mode transceiver.
**TRIO KENWOOD:** TR-7400A — 144-148 MHz FM transceiver.
**YAESU MUSEN:** FT101E — 160-10 metres, AM, SSB, CW transceiver.
**YAESU MUSEN:** FT301 series, 160-10m AM, SSB, CW transceiver.

## RECEIVERS:

**DRAKE:** SSR-1 Wadley Loop receiver.
**TRIO KENWOOD:** R300 general coverage BCL receiver.
**YAESU MUSEN:** FRG-7 general coverage Rx, Wadley Loop System.
**NATIONAL:** DR48 (RF4800) — general coverage, digital dial, communications and BCL receiver.

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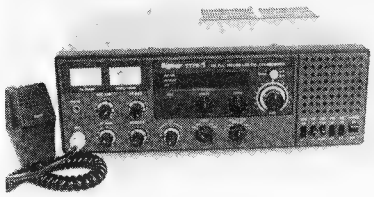
# Bigear V-UHF TRANSCEIVER

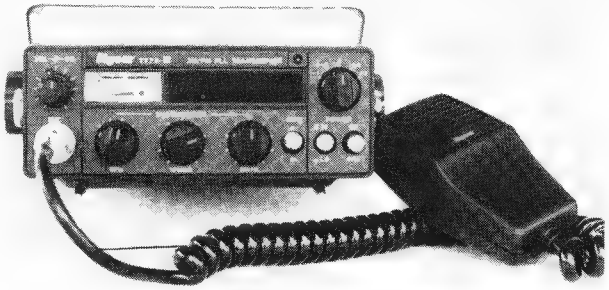
## TYPE-1 — 2m FM SSB CW PLL SYNTHESIZED MOBILE BASE TRANSCEIVER — $769

- 144 - 148 MHz, PLL digital synthesizer system
  FM: 800 channels (5 kHz step)
  SSB: 400 channels (10 kHz step) plus VXO system (± 7 kHz)
- AC 117/240V, DC 13.8V, two-step power supply
- Digital display system (using a large-sized LED) provides reading up to six figures
- Easy-operating, separate and selective mechanism displayed by the frequency unit for wider operation of FM/SSB
- Transmitting output: 10W/1W, shifting mechanism
- Front loudspeaker suited for base station
- AGC FAST/SLOW, two-step change-over circuit
- Easy-reading, separate S/RF centre meter
- ON AIR/RECEIVE/RIT position displayed by LED
- Included RIT, AGC, VOX and noise blanker circuit
- MIC GAIN CONTROL is provided with front panel for ease of operation
- Highly sensitive, highly selective six-element SSB filter



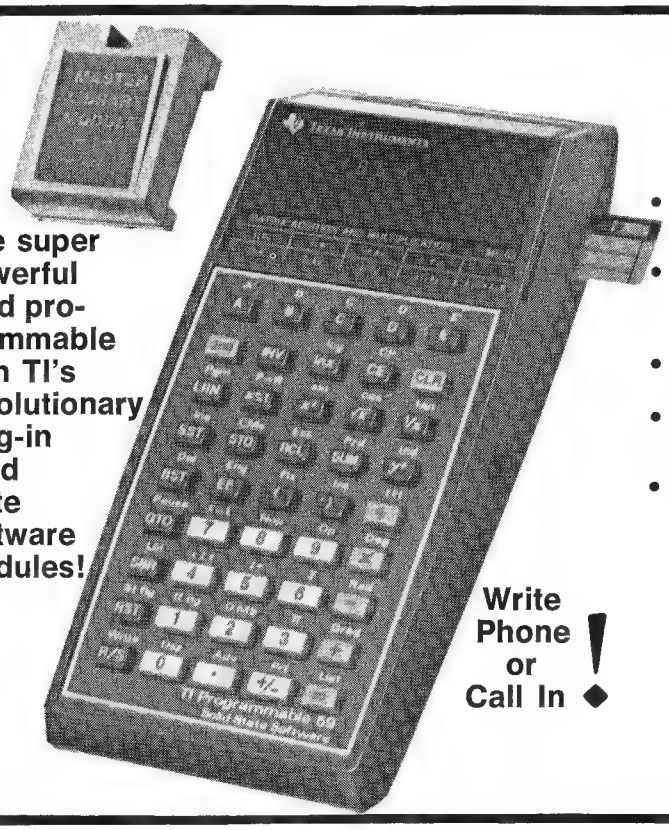
- A large-sized VXO mechanism provides reading of the frequency
- Provides repeater operation of ± 600 kHz and ± 1 MHz
- Optional part: tone burst module

## TYPE-2 — 2m FM PLL SYNTHESIZED MOBILE TRANSCEIVER — $385



- 144 - 148 MHz, PLL digital synthesizer system (800 channels)
- A large-sized LED, digital display system provides readings up to six figures
- Easy-operating separate and selective mechanism displayed by the frequency unit for wider operation
- Transmitting output: 25W/1W, two-step selector switch
- Highly reliable plug-in module
- Completely narrow band system for transmission and reception
- Provides repeater operation of ± 600 kHz and desired frequency
- RF output with S meter indicator
- Designed for high reliability and high sensitivity
- With external loudspeaker and external accessory connecting terminals
- Easy-to-operate AF/SQ coaxial type knob
- Sturdy, removable mobile mounting system
- Optional part: tone burst module

## TYPE-3 — 70cm FM MOBILE TRANSCEIVER AVAILABLE SOON!



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- The Programmable 59 is truly computer-like. You have up to 960 program steps, or up to 100 memories to work with. And, when integrated with the Master Library module it delivers up to 5000 steps!
- *Blank magnetic cards too.* So you can write and record your own programs for your personal library to use whenever you wish. You may also make your program confidential so that no one but you can "look" at it.
- The TI-59 also works with TI's PC-100A thermal printer.
  *Also available:* Programmable TI-57 and TI-58.
- Full range of Texas calculators — TI-30SP, SR-40, SR51 II, TI Money Managers, TI Business Analyst, TI MBA (Business, Financial and Programmability).
- Other makes such as "NATIONAL" semi-conductors, "ELCON" and "BMC" also stocked.

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# LETTERS TO THE EDITOR

**Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.**

The Editor,
Dear Sir,
The Goulburn Amateur Radio Club has only been operating for a little more than one year.

The results of the RD Contest just published have given the club something to be proud of. We have only 1.. licensed operators in the district, 11 logs were entered for a total of 2,569 points from 1,427 contacts.

Can any other club say that they had a better performance?

73s and will be there again next year.

David Thompson VK2BDT. ■

The Editor,
Dear Sir,
Had VK7NOW read the excellent articles on the G5RV by Maurie VK3AVO (AR, April 1974) and Phil VK5NN (June 1974), he might have been less rash with his statements "All text books and AR are wrong" and "The correct length of 300 ohm ribbon is 32 ft. 6 in.". (Letter to the Editor, February 1978 )

The authors mentioned have each approached the problem by entirely different methods, and apparently with equally successful results. It is worth noting that neither of them specified a "correct" length in terms of feet and inches.

I have no doubt that VK7NOW's friend in ZL is putting out a "superb" signal with his 32 ft. 6 in. feeder. So is Ted Bowden G2AYQ with his 29 ft. 3 in. feeder — S9 in VK3 from 120 watts PEP. In a letter dated 25th January, 1978, Ted says, "Make the feeder 34 ft., then trim it back ¼ inch at a time keeping an eye on the SWR meter. Mine was trimmed right back to 29 ft. 3 in. for zero SWR. I have worked the world with the G5RV."

There are many variables involved in getting **any type of antenna** to perform at its optimum at a particular location. What is "correct" at one QTH may be quite unsatisfactory at another, and therein lies one of the fascinations of amateur radio.

To assume that a certain antenna arrangement is "correct" for every situation is akin to buying a motor vehicle solely on the assurance that it will perform satisfactorily under all conditions of service. In both cases, we need to do a little "test-driving" before either accepting or rejecting a particular product.

Yours sincerely,

R. Goslin VK3SV. ■

R. J. Zimic,
55 Hobart Street,
St. Marys, N.S.W. 2760

The Editor,

1st February, 1978

Dear Sir,
I have only recently joined the WIA as a full member, however this is not without problems.

The nature of my problem, and perhaps common to the Australian Amateur is self explanatory by the accompanying copy of a letter which was sent to the Regulatory and Licensing Branch in Sydney, N.S.W.

A copy of the letter has also been sent to Mr. R. Gillard (Federal M.P.).

I am sending you the copy of this letter in the hope that you might be interested in publishing it in the AR magazine.

This is the tenuous hope of improving the prevailing licensing conditions, and in the interests of the future Amateurs in Australia.

Yours faithfully,
R. J. Zimic.

(Copies to P. and T. Department and R. Gillard, M.P.)

Superintendent,
Regulatory and Licensing Section,
Postal and Telecommunications Department,
23 Berry Street,
North Sydney, N.S.W. 2060.

Dear Sir,
I am writing to you in protest to the delays in which a Radio Amateur can obtain his licence.

I deplore the attitude of your department, for so little concern to the person who has troubled himself to qualify for the requirements, only to find that the "red tape" has made him now a second rate citizen.

Over six months when I applied for the AOCP examination, I was fired by the enthusiasm of becoming a Radio Amateur. Now I am still waiting for the station licence, but my enthusiasm has changed to bitterness and disappointment.

I believe that six months waiting period is quite common; if this is continually tolerated, then the Amateurs deserve to be called "nuts".

If there is any interest in radio left in me now, I will consider in joining the CB service. I believe that the CB licence may be acquired in a reasonable time. (Although a licence is often not necessary.)

I do not seek explanations, nor a reply to this letter, as such measures are unproductive. However, I wish to be "counted" by expressing my deep disappointment over the attitude of your department.

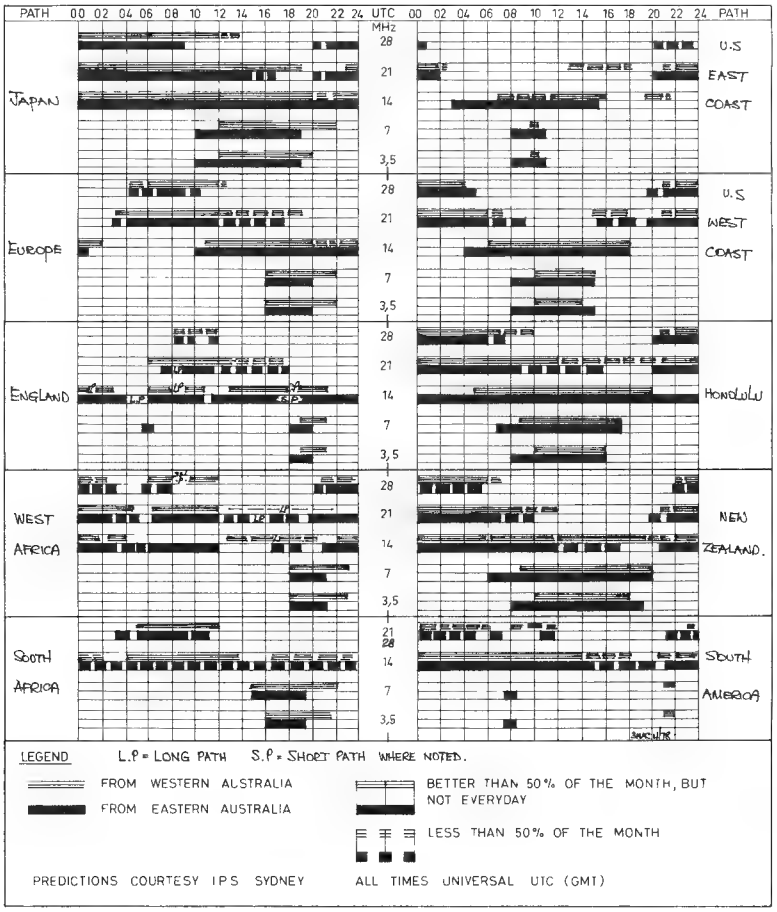
Eventually, if and when you grant me a licence, I might become interested in this hobby again, but not without the unpleasant memory.

Yours faithfully,
R. J. Zimic.

(A copy of the letter to the Federal Member for Macquarie was received but is not produced here because of space limitations.—Ed.) ■

# IONOSPHERIC PREDICTIONS

*Len Poynter VK3ZGP/NAC*




Since September 1977 there has been a steep improvement in conditions, particularly on the 28 and 21 MHz bands. Both have seen activity at great levels. 28 MHz has enjoyed probably the greatest increase particularly during the pre-summer period with good openings daily across most paths. 21 MHz was not without its share of the action with long, regular openings across all paths.

Sunspot data available shows 11/77 with a mean of 26.6 12/77 as 41.3 1/78 as 49.3. The running smoothed numbers for 5/77 — 23.7, 6/77 — 25.6, 7/77 — 28.1 predicted smoothed means for 3/78 — 45, 4/78 — 47, 5/78 — 49, 6/78 — 51, 7/78 — 53.

The 10.7 cm (2800 MHz) solar flux has steadily risen over the past six months with some enormous bursts equating with peaks in daily sunspot numbers. The means for 1977 were 1/77 — 77, 2/77 — 82, 3/77 — 77, 4/77 — 78, 5/77 — 80, 6/77 — 92, 7/77 — 81, 8/77 — 84, 9/77 — 100. Predicted means for the following period are 10/77 — 102, 11/88 — 106, 12/77 — 108, 1/78 — 107, 2/78 — 106, 3/78 — 105, 4/78 — 104, 5/78 — 105. The means are as ambiguous as the sunspot means but generally represent a rather high burst during each month settling to an average which is climbing slowly month by month.

Probably the greatest effects on propagation that are felt at least twice each month are ionospheric storms which produce a decrease in MUF below expected values during the storm periods. Broadly speaking there are two types of storms according to the solar event causing them. The flare induced storm, and the recurring storm are the most common. The first is of a sudden nature caused by a solar flare. These types are most common as the cycle is ascending towards its peak and the effects last up to a few days. The recurring storm is associated with variations in the geomagnetic field, due to the presence of the solar wind which changes the earth's geomagnetic field as the structure sweeps past the earth. These types of storms last up to seven days but are more severe about sunspot minimum.

Storms are related by changes in the normal currents that flow in the magnetosphere and

ionosphere. The largest contribution to the geomagnetic field index K is provided by ionospheric current systems, concentrated in and near the auroral zones. Since it is these currents which appear to give rise to the major ionospheric storm effects, K is often used as an indicator of expected disturbances in the ionosphere. WWV provides this information in the 18 minute past the hour report on solar terrestial conditions and is as good a guide as is possible on a 6 hourly basis.

Storms generally exhibit both positive and negative phases, typically giving an enhancement effect (rise in MUF) on the first day and then depression (lowering of MUF) on the following day or two.

It has been found that a positive phase occurs in the afternoon and early evening if the geomagentic storm starts in the afternoon, while a storm starting in the midnight to dawn period results in an immediate negative phase. This particular phase is probably the most interesting aspect as the commencement time will invariably dictate what paths may be open and the degree of signal availability is directly related. The movement of the storm front will open paths to a higher usable frequency ahead of the front and decrease the usable frequency behind the front. So the direction the front is travelling will control the propagation. The fact that a storm is in progress will often be illustrated by tremendous increases in signal levels in one direction and almost total loss in the opposite direction. Sudden changes in either direction is a fair indicator of an impending storm. They can be felt over very long distances and relatively short distances — even cross town in the negative phase.

However fixed circuit communications are the most disrupted as changes in frequency are required to compensate for the losses incurred. The amateur generally can take advantage of a rotary antenna to seek propagation over unaffected areas. Of course there are exceptions in all cases.

Forecasting of ionspheric conditions is a science similar to weather forecasting. Averages mean little and local events can completely dominate an otherwise perfect situation. There is so much going on all the time that ideal conditions seldom exist for the periods predicted. However extremely good conditions out of character with normal often occur and some fortunate amateurs are always there to take advantagee of the event. So please do not take a dead band as being dead Call · - in at least two or three directions to test feasibility from unexpected directions. Like working West Africa over South America with both beaming around the South Pole. It's been done quite recently to the surprise of both parties. Long path propagation on 3.5 MHz around the twilight zone attracts quite a few stalwarts to this form of DX. Some staggering distances have been worked over long path in recent years. VK3 to EA8 was a great one. Many enjoy this rather sophisticated mode.

At the time of writing the solar flux had climbed to 169 in the first week in February and held quite high for a further five days, settling to 125 on February 21 and immediately started a climb upwards. Whilst the flux levels are high it does not necessarily mean above average conditions will always apply. WWV are using solar activity statements as Low to Medium, Medium to High, and on rare days as high. Flare activity over the past months has been high and dependant on the class of flare conditions, do change abruptly.

The period March to May and in particular September to December are certainly worth watching. 28 MHz is bound to show longer periods of action. Make a point of getting in on the action. This year you will be in for some pleasant surprises. ■

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*Syd Clark, VK3ASC*

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**QST November 1977**
An Introduction to the World Above 50 MHz; Homemade Differential Capacitors; A Versatile Digital Frequency Display; The Resistance Synthesiser; A Passive CW Filter to Improve Selectivity; A Combination Fixed-Voltage Supply; The Invisible Rhombic; How to Tune Your Transmitter; ARRL Code of Ethics; Network Hams: A Hobby Becomes a Career; November Sweepstakes propagation Predicting; A Baptism of Fire; The "Cardboard Clock" — A Simple Universal Time Converter; QSLs, How to Get Them in a Hurry, Pt. 2; Self-Regulatory — Are We?; FCC Reacts on Repeater Deregulation; Moved and Seconded; So What's an IARU?; Rules, 10 Metre Contest; Rules, 160 Metre Contest.

**QST November 1977**
A Key to Success; Daniel's Key; A Poor Man's Paddle; A New Era in Voice Communication; The Data Set 101A; VHF DX via Meteor Scatter; Predicting the Coverage of a Repeater; Low-Noise Receiving Antennas; How to Adjust a Straight Key and Send Good Code; Telegraph Keys "As American as Pumpkin Pie"; A Bonanza awaits You in the Ham Ads; Ham Radio for $50; How They Did It; Is the Component Market Drying Up?; ARRL Destroys Windmill; Bermuda, Hams to the Rescue; Rules, 31st Sweepstakes; Frequency Measuring Test; DX Century Club Awards; 44th ARRL International DX Competition; Field Day 1977 Results.

**SHORTWAVE MAGAZINE September 1977**
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**BREAK-IN November 1977**
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**BREAK-IN December 1977**
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**RADIO COMMUNICATION November 1977**
A Multimode Transceiver Using ICs, Pt. 2; The G3XAP Directional Antenna for the Lower Frequencies; Lettering of Panels and Meter Movements; Secondary Standards; Accounts and Review for the year ended 30 June, 1977.

**RADIO COMMUNICATION December 1977**
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**CQ September 1977**
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**CQ October 1977**
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**HAM RADIO August 1977**
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**HAM RADIO September 1977**
Sync Generator for Amateur Television; Tracking Oscar Satellites; Digital AFSK Generator and Demodulator; Pi Network Design and Analysis; Double-Balanced Mixer Circuit Packaging; Using a Frequency Counter as a Synthesizer; Amateur Hydroelectric Station; Designing Regulated Power Supplies; VHF Priva-call System; Measuring Resistances of less than 1 ohm; Tone-Burst Generator; Power Supply Troubleshooting; Checking Repeater Shack Temperature; Microprocessor interfacing the 8080 logical instructions. ■

# LARA

*Ladies Amateur Radio Association*

This month, as part of the series on famous YLs, we start with the obvious choice, VK3YL herself! The holder of this distince call is Austine Henry, who has been a licensed amateur since 1930.

Austine first became interested in amateur radio as a child whilst convalescing after an operation. She was given a crystal set, complete with cat's whisker with which she experimented in receiving. Her first transmitter was a "shortwave" battery-powered rig (home brew recipe from the very start), which was followed by an AC transmitter soon after. Improving her knowledge of regulations and morse (as well as theory), Austine gained her licence to enter what must, in that period, have been exclusively a gentlemen's world. It can be a trifle daunting even today for a would-be YL licensee to enter an exam room full of OMs, so we all look up to Austine who set us such a precedent quite a while ago.

Since then, Austine has been active in many fields of radio. She was an instructor with the WIA, giving lessons to members of the Armed Services during the war, and was a member of the RAAF Wireless Reserve, from which she has some happy memories and some warm, long-standing friendships

Austine has operated for most of her career on 20, 40 and 80m CW and VHF AM phone. She at one stage used post-war surplus equipment but then moved on to own a Collins S line with SSB. Her log books include 322 countries worked, which gives an indication of her interest in DX.

As a member of the WIA, ARRL and RSGB, Austine did not, of course, really need to join a new club, but ever since LARA first started she has given her enthusiastic support, bringing valuable experience and advice.

Amongst Austine's non-electronic interests are her relaxations of philately and golf (especially golf). As a keen golfer she is currently fretting at the bad luck which caused a broken wrist and has kept her off the golf course for many weeks. Best wishes to Austine for a speedy recovery.

Another LARA member who has been off golf courses and basketball courts and in the hands of the medical profession is Irene, YF of Jeff VK3YER. Best wishes to Irene for a "hamonious" recovery. ■

**VK5 LARA lovelies — left to right: Myrna VK5YW, LARA Net control on Mondays; Rhonda Holker VK5N??, enjoys LARA; Jenny VK5ZBI, first woman "Z" call in VK5 — is active in LARA.**

# VHF-UHF
# AN EXPANDING WORLD

*Eric Jamieson, VK5LP*
**Forreston. 5233**

**AMATEUR BAND BEACONS**

| | | |
|---|---|---|
| VK0 | VK0MA, Mawson | 53.100 |
| VK1 | VK1RTA, Canberra | 144.475 |
| VK2 | VK2WI, Sydney | 52.450 |
| | VK2WI, Sydney | 144.010 |
| | VK2RHR, Mittagong | 144.120 |
| VK3 | VK3RTG, Vermont | 144.700 |
| VK4 | VK4RTL, Townsville | 52 440 |
| | VK4RTT, Mt Mowbullan | 144 400 |
| | VK4RBB, Brisbane | 432.400 |
| VK5 | VK5VF, Mt. Lofty | 53.000 |
| | VK5VF, Mt. Lofty | 144.800 |
| VK6 | VK6RTV, Perth | 52.300 |
| | VK6RTU, Kalgoorlie | 52.350 |
| | VK6RTW, Albany | 52.950 |
| | VK6RTW, Albany | 144.500 |
| | VK6RTV, Perth | 145.000 |
| VK7 | VK7RNT, Launceston | 52.400 |
| | VK7RTW, Lonah * | 432.475 |
| VK8 | VK8VF, Darwin | 52.200 |
| JA | JA2IGY, Nagoya | 52 500 |
| KG6 | KG6JDX, Guam | 50.110 |
| KH6 | KH6EQI, Hawaii | 50.104 |
| ZL1 | ZL1VHF, Auckland | 145.100 |
| | ZL1VHW, Waikato | 145.150 |
| ZL2 | ZL2MHF, Upper Hutt | 28.170 |
| | ZL2VHP, Palmerston North | 52 500 |
| | ZL2VHF, Wellington | 145.200 |
| | ZL2VHP, Palmerston North | 145.250 |
| | ZL2VHP, Palmerston North | 433 250 |
| ZL3 | ZL3VHF, Christchurch | 145.300 |
| ZL4 | ZL4VHF, Dunedin | 145.400 |

* Listed again.

Peter Dodd, our Federal WIA Manager, forwarded a copy of a letter he received which quoted some interesting information in regard to beacons which had been taken from the January 1978 issue of IARU Region 1 Journal, which mentions the French beacon on 50 104 MHz FX3VHF was heard twice in Eastern Canada by VE1ASJ during June 1977. The Es tests of FX3VHF were switched to TEP in August and the beacon signals were logged in October 1977 by ZE2JV about 8137 km to the south. The signals were also heard later by ZE1JJ in Rhodesia. The FX3VHF beacon runs 70W RF into a stack of two 6 element yagis, giving an e.r.p. of 1 kW.

Further comments in the journal were that the 1977 summer season seems to have seen a record Es VHF activity in the European area and generally around the world. Distances of 8500 km have been covered on 50 MHz between Japan and California.

Reports on these long distance contacts have steadily increased but it is not known whether this is due to the increased number of observers or to an increase in the activity of Es itself. Possibly both apply. More research, observations and reports are required to detect possible recurrence patterns and to relate these to other geographical or solar phenomena. Any thoughts?

Steve VK3OT reports following statistics of VK9NI for six metres: 29-11-77 1850-1900Z VK2; 13-12-77 1745-1800Z ZL3QK, ZL4LV; 25-12-77 1540-1552Z VK1, 2 and 4, ZL1QI; 8-1-78 1247-0235Z K1, 2 and 4 up to S9 +, worked 24 VK2, 1 VK1 and 19 VK4. Heard bursts from VK3AUR and VK3OT. A VK6 was heard calling YJ8KM, but nothing since. Chas. is hoping for an improved season next year, and worked sufficient this time to keep him interested.

Similarly Ken YJ8KM had about 4 days to play around, on 7-12 worked VK2, 3 and 4, plus ZL4LV at 9 +; 22-11-77 first six metre opening for season worked 14 in VK4, plus VK2, 3 and 5; 7-1-78 VK8ZCJ, VK8ZGF, heard VK8VV and VK6BV. Ken ZL4LV 5 x 7; 8-1-78 worked 29 VK4s, 6 in VK5, is now SMIRK number 2446 and had a pretty good time on six this year. We all hope he will be around again next year.

Steve K3OT is holding over 100 cards for distribution from YJ8KM. If you need yours please send stamped addressed envelope. SMIRK 6-6 co-ordination net operates on 21.352 MHz at 2352Z Sundays, and during the equinox 14-3 to 14-4 will be controlled by VK3OT and VK3AKK.

A reader of this column for some time has written to say he has now received his call sign, VK3ANI, and Evan lives in North Balwyn. He mentions hearing both the Albany and Perth beacons on 2 metres on 17-2, and calling using CW at 0745Z on 144.01 and 144.02, but no answers. Evan runs 15 watts to a 7 element yagi and keeps a good eye on the weather maps to alert him for the right conditions for 2 metres. However, it would be wise to either call on 144.1 or if that is occupied just above or below, if anyone is around they will tune for signals.

Thanks for writing, Evan, and will look forward to hearing from you again some time. I thank you for the interesting support you have given to the 50 to 52 MHz proposal, and filed your letter for use later.

David VK5KK reports on a number of 6 metre openings to Japan during February, namely 11-2 with signals to 5 x 8 at 0600Z from JA0 and JA7, opening lasting 15 minutes; 18-2 JA7MIT and JA0; 25-2 JH1HHE 5 x 3 at 0549Z for 2 minutes and JA7MIT at 0620 5 x 5 for 10 minutes. The moral is that it pays to be around at the right time, but also indicates either an improvement in overall band conditions or the JAs are around in VK5 more often than previously thought but for such brief periods they were generally missed. David also mentioned George P29HV had been noted working KG6JIH and P29ZWW working KG6JJI and KG6—DX about 15-2.

Throughout February there were a number of excellent 144 MHz openings across the southern parts of Australia, with Albany in VK6 being the starting point in most cases, and extending right through to eastern Victoria. From Albany Aub VK6XY, Wally VK6WG, Bob VK6BE and Bernie VK6KJ have held the fort, many VK5s, including VK5PB, ZPS, NY, KK, SV, LP, RO, ZIW, LZ and others were involved, plus the boys in Mt. Gambier, and going through into VK3 to find VK3ZQV, ZBJ, AUR, AOS, etc.

Not only has 144 MHz been involved, so also has been 432, 1296 and 2304 MHz, so much so that established records have tumbled during February. See the separate box on this page for details of the outstanding efforts of those involved in these long distance contacts on 432 and 2304.

At my own QTH behind the 30 dB hill to the west, I have found it to pay handsomely to upgrade the antenna department, and the two 16 element yagis stacked on 144 MHz have really paid off in that when the boys in Adelaide now work Albany, I can claim my share too, perhaps not as strong, but nevertheless strong enough to have contacts with all stations on hand.

Having observed these improvements I found myself rather disgruntled with what I was hearing on 432 MHz, so I began to listen to the prodding in the first instance by David VK5KK who already sported a 16 el. yagi on 432. He was soon joined by Bob VK5PB who in very strong terms condemned the antenna and transmitter set-up on observing same. So with Bob's help and encouragement the old 13 element yagi was pulled down together with its RG8AU coax., and replaced with a 16 element yagi — a la 5 PB type — fed with FLD4 heliax cable kindly placed in position on the tower by Graham VK5EU and my nephew, Trevor, to a height of 70 feet, a bigger black box to boost the transmitter power and all systems were go on 18-2-78 — a very appropriate day, being my birthday, so it was a nice present, and thanks to all concerned. However, more was still to come. That same night the boys in Adelaide were working Aub VK6XY in Albany on 432, so pointing the new antenna west through the 30 dB hill, which now by reason of being hit with UHF signals becomes a 60 dB hill, and lo and behold, after some effort, a two way contact ensued between VY6XY and myself on 432.1 with signals 5 x 1, not strong but good enough to put on tape. My day was complete, what had been considered the impossible had been achieved. Signals at VK5KK at the time from Albany were 5 x 9 on peaks, dropping to 5 x 1 through my hill! A great day for me!

The purpose of all this is simply to indicate what can be done with the help of some good mates who have confidence in the possibilities and prepared to help physically, and to the encouragement given by David VK5KK and Bob VK5PB at this end during the contact and to Aub VK6XY for staying on long enough at his end to make the contact possible.

The improvements into the Adelaide area have been quite spectacular on 432 since the upgrading; it's a rugged path but Bob VK5PB now gives me a genuine 5 x 9, and I do the same for his signal. Subsequent to the Albany contact I almost made it with Michael VK3ZQV, 100 miles east of Melbourne on 432.1 on 20-2, but conditions were not so good. Anyway, there will be other times, and I look forward to them. Maybe all this will encourage others to upgrade their own equipment, the rewards are obviously there.

**VK8 TO JA ON 144 MHz**

That's a fact, it has been done. Graham VK8GB (ex ZCJ) contacted JH6TEW, whose name is Tel, at 1200Z on 24-2-78 on 144.110 MHz SSB. Graham received 5 x 1 and Tel 5 x 2, the path distance being presently estimated at only 49 miles short of the new record established on 29-10-77 between YV5ZZ and LU1DAU of 3135 miles (5044 km). VK8GB used an FT101E driving an FT250 transverter with a QQE06/40 linear amplifier to a 10 element yagi. Tel JH6TEW used a TS700G2 with a receiving pre-amp included to a pair of 6 element crossed yagis. VK8VV was listening to contact, congratulations, boys, you have established the first amateur contact on 144 MHz between Japan and Australia, a fine effort, let us all hope your next contact Graham will be enough distance further to bring the 2 metre record to Australia. If so, it looks like Australia will be at least one end of records for 144, 432, 1296 and 2304 MHz!

Proof that scheduling pays off is shown in that VK8GB and VK8VV had been running skeds every night on 52 and 28 MHz for a week or more previously, and on 21-2-78 the first signals were heard in Japan at 1237Z, but no contact. The same results on 23-2, one way at 1200Z, with the next night, 24-2, resulting in the two way contact. Graham commented signals were no where near as good as the previous time last year when he heard all the FM signals but unable to make contact. Six metres was open all the time. 28, 52 and 144 MHz all exhibited the same reception pattern, it did not seem to be TEP which produced the contact, possibly something to do with a density quotient for want of better description. My thanks to David VK5KK for collecting the above information for me. No doubt I will be hearing direct from Graham in due course.

**MOONBOUNCE REPORT**

Lyle VK2ALU in "The Propagator" reports that the February 432 EME News includes details of different scheduled EME tests for the month February, involving over 40 stations in all continents. They will be using the frequency range from 432.000 to 432.060 MHz. Also it is normal for a number of other contacts to be made on an unscheduled basis.

Reports continue to be received of EME contacts being spoiled by interference from non-EME stations using the same frequency. The station causing the interference does not have to be in the same part of the world as either of the EME stations and, of course, probably cannot hear either of the EME stations.

The message to VK stations on 70 cm is clear — if you are using other than low ERP on transmit, **PLEASE do not use 432.00 to 432.060 MHz**, especially on Friday night and on week-ends — after all, there is more than ample spectrum space above 432.060 MHz. This is now being recognized by the more progressive overseas Amateur Radio Organisations who are modifying their "band-plans" accordingly.

VK2AMW is scheduled for EME tests with YV5ZZ and W6ABN between 0000Z and 0100Z on 11-2-78.

Before closing there are two things I missed earlier. Firstly, Bob VK5PB and Aub VK6XY were not content just to work one another on 432 SSB during the opening on 17-2 and 18-2, but had successful contacts on the same band using RTTY, and that's not the first time they have done it either! The other matter was that Tony

VK6BV has sent in a fairly long list of 28 MHz beacons throughout the world. These seem to listed using the newly proposed system of frequencies, and obviously some or most are still using the old frequencies. I will file the list for the time being Tony, until more definite information is available.

The rest of the current news is included in the box which details the record breaking contacts, so in an effort not to use quite so much space this month, I will now conclude with the thought for the month: "The world is moving so fast these days that the man who says it can't be done is apt to be interrupted by someone doing it."

73. The Voice in the Hills.

**WORLD RECORDS**

**A world record contact on 2304.1 MHz on 17-1-78 at 0755Z occurred between Reg VK5QR in Adelaide and Wally VK6WG in Albany over a distance of approximately 1170 miles. VK5QR used SSB and VK6WG used CW, and signals peaked to S8/9 both ways. VK5QR used synthesized SSB running about 4 watts into a 3 foot dish at 35 feet. VK6WG originated his signal on 128 MHz using an SCR522 aircraft unit, finishing with a 2C39A doubler with 50 mA plate current to give approximately 3 watts into a 6 foot dish not very high. The QSB observed was slower on 2304 MHz compared with 1296 MHz, and at the time signals were stronger on 2304 than 1296 even with more power on 1296. The contact was taped at both ends and replayed over 144 MHz for all to hear. Congratulations, gentlemen, a fine effort.**

**On 22-2-78 at 1355Z what also is likely to be a world record was established with a 432.1 MHz contact between Aub VK6XY in Albany and Michael VK3ZQV, 1¼ miles south-west of Carra ung, about 100 miles east of Melbourne; Aub received VK3ZQB 4 x 2 and Michael received VK6XY 5 x 4.**

**VK3ZQV used an IC202 into a Microwave Modules transverter mounted at the antenna, being two 12 element phased arrays mounted side by side and 60 feet high. Power output would have been a maximum of 10 watts. VK6XY used an FT620B into a Modular Developments transverter running 8 watts PEP into a KLM 35 watt amplifier, such drive being incapable of obtaining full output. Antenna two 16 element long boom yagis, spaced 6 feet, and 30 feet high fed with UR67 coax.**

**144 MHz used for setting up contact commencing at 1131Z, and while Mike could hear Aub's carrier each time they tried on 432, it was not until 1355Z the signal improved sufficiently for a two way QSO to take place. Contact was maintained on 144 MHz for over 4½ hours with good signals, but the 432 MHz band was not in good shape, as signals into Melbourne on previous occasions had been much better.**

**Congratulations to you, gentlemen, as well, a fine effort. . . . VK5LP**

**NEW 144 MHz WORLD RECORD**

**On 12-2-1978 at 0015Z LU5DJZ located at Mar Del Plata 400 km south of the capital of Argentina contacted KP4EOR in Puerto Rico over a distance of 6400 km (3977 miles). Signals were 5 x 9+ on 144.1 MHz. LU5DJZ used 400 watts of SSB to 11 over 11 yagi antenna, KP4EOR used 800 watts SSB to an array of 4 x 9 element yagis.**

**Ray DL2GG/YV5 also contacted LU5DJZ for a distance of 5500 km on the same day, using 100 watts of SSB to an 11 over 11 yagis.**

**The above information was received via Peter VK8NJW.**

**STOP PRESS**

David VK5KK reported hearing VK3RTG, the Melbourne beacon, on 144.700 at 5 x 1 at 1410Z on 28-2-78. As far as is known this is the first reported hearing of this beacon in the Adelaide area.

And possibly even more interesting to everyone is the reception by David of VK7RTW at Lonah on 432.475 MHz on 28-2-78. This beacon was first heard at 1435Z, peaked to S7 at 1525Z and disappeared at 1535Z. David reports it operates close to the stated frequency with slight variation, uses FSK at 1 KHz shift to high side with key down. Quick QSB noted on signal. No other signals heard of course. The Channel 8 repeater from Launceston was also through at the same time, together with a multitude of repeaters from VK3.

Good work, David, but it's a bit late really for most of us, hi!

Although I have not been advised, it is now obvious the VK7RTW beacon is now operational again so is included in the listings. Proof of both hearings was confirmed when David played tape recordings of both stations over the air the next day to me.

From Graham VK8GB a further rush item:

"On 25-2-78 at 1145Z Brian VK8VV worked JH4JPO on 144.100 on CW received and sent 4 x 1. At 1150Z he worked JH6TEW on 144.101 on SSB again 4 x 1 both ways. The distance to JH4JPO was in excess of 3200 miles. ■

# IARU NEWS

**IARU MEETING IN GENEVA**

A meeting of the IARU President's WARC Advisory Committee was held in Geneva from the 13th-18th February, 1978. This Committee has previously been informally known as the International Working Group (IWG).

The President of IARU invited Dr. David Wardlaw VK3ADW, the President of the Wireless Institute of Australia, to attend this meeting as it is probable that Dr. Wardlaw will be a member of the Australian delegation to WARC 1979. Present at the meeting held in Geneva were, in addition to the President of IARU, IARU Secretary Richard L. Baldwin W1RU, the Assistant Secretary of IARU David G. Sumner K1ZZ, the Secretary of IARU Region 1 Roy F. Stevens G2BVN, the President of IARU Region 2 Victor C. Clarke W4KFC, and a Director from Region 3 Michael J. Owen VK3KI. In addition to David Wardlaw VK3ADW, Wojciech Nietyksva SP5FM, and Merle Glunt W3OKN, were also present.

The timing of this meeting was fixed to coincide with the ITU World Administrative Radio Conference (Aeronautical (R) Conference). This enabled those present to observe an actual ITU conference. In addition to Merle Glunt, who has recently retired from the Federal Communications Commission and is an expert on ITU procedures, presented a Seminar on the working of that organization.

The IARU Headquarters and Region 1 hosted a reception at the ITU building for delegates to the Aeronautical WARC on Thursday, 16th September, and this enabled those attending the Committee meeting and other Amateurs from the Geneva area to meet many of the delegates from many different countries.

The formal meeting of the Committee gave consideration to numerous matters relating to the WARC. The importance of an Amateur being a member of a delegation, either as an advisor or as a full member, was discussed and shortly a circular will be sent to all Societies by IARU Headquarters stressing the importance of this matter.

In addition to that circular IARU Headquarters will be forwarding to each Society a letter restating the IARU position on Article 41 of the Radio Regulations — the article dealing specifically with the Amateur Service. The organization of the IARU WARC team to WARC 79 was discussed in considerable detail and shortly the President of the IARU will be making a formal statement to the IARU member societies on the organizational policy that has been adopted. IARU Headquarters has agreed to prepare a descriptive and informative booklet on the Amateur Radio Service suitable for distribution to telecommunication authorities in developing countries. The importance of the special preparatory meeting of the CCIR in October 1978 was also discussed and the possibility of the submission of papers furthering the interests of the Amateur Service was explored.

Following the meeting in Geneva Region 3 Director, Michael Owen VK3KI, and WIA President, David Wardlaw VK3ADW, visited a number of societies in Region 3. Meetings were held in Tokyo with the President of JARL, Shozo Hara JA1AN. On the 21st February, 1978, the JARL League Headquarters were visited and a press conference was held. That same evening Michael Owen and David Wardlaw and their wives (who were travelling with them) were invited to a formal dinner given by JARL. The importance of the CCIR special preparatory meeting was discussed with Shigetake Morimoto JA1NET, who is a Director of JARL and President of JAMSAT, and Keigo Komuro JA1KAB, both of whom are deeply involved with JARL's preparation for WARC.

On the 22nd and 23rd a visit was made to Seoul in the Republic of Korea to meet with representatives of the Korean Amateur Radio League. After this visit two further days were spent in Japan, enabling further consultations with the President of JARL, JA1AN, and Region 3 Director, Matsumi Saito JH3PJE.

In Singapore, meetings were held with representatives of SARTS and Region 3 Director, Tan Lian Huat 9V10D, and Region 3 Secretary, David Rankin 9V1RH. ■

**Michael Owen VK3KI replying at the formal dinner given by JARL at Tokyo. WIA President David Wardlaw VK3ADW is on the left and Mrs. Nanette Owen is on the right. JA1AN photo.**

# DICK SMITH'S ATTITUDE ON SALES TO UNLICENSED OPERATORS

In Dick Smith's submission to the Australian Government over 12 months ago he insisted that the seller of equipment be responsible to see that the equipment was licensed.

> " The retailer should also be made responsible by legislation to provide a full listing each month of all purchasers who do not have a license . . ."

Until the Government takes this advice there is absolutely no way that unlicensed people can be prevented from operating equipment on the amateur or any other bands.

This is unfortunate — but it's a fact!

Sure — it's OK for a retailer to state in advertisements that "Purchasers may be asked to provide evidence that he/she is the holder of an appropriate certificate of proficiency ". We have done this in the past only to find that unlicensed operators have had licensed friends purchase equipment for them.

We have to have legislation.

If you support Dick's original proposal that retailers be made responsible to provide the P&T each month with a listing of all purchasers of transmitting equipment, call in to any Dick Smith Store and sign our petition. This petition asks for control on sales of all transmitting equipment, instead of lip service to a rule which can easily be by-passed.

If you are not convinced that Dick's attitude is genuine, we suggest you obtain a copy of "Dick Smith's Australian CB Radio Handbook" and see for yourself the responsible guidelines towards licensed operation.

No other supplier has made the effort to publish such a guide.

## DICK SMITH ELECTRONICS

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| $25–$49.99 | $3.00 |
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| $100 or more | $5.50 |

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SYDNEY: 162 Pacific Hwy, Gore Hill. Ph 439-5311. Ample parking at door.

SYDNEY: 30 Grose St, Parramatta. Ph 683-1133. 1st floor – friendly store!

MELBOURNE: 399 Lonsdale St, City. Ph 67-9834. New: right in town!

MELBOURNE: 656 Bridge Rd, Richmond. Ph 42-1614. Easy access: huge stock.

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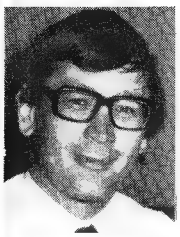
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Ike Bain
VK2AIG

So they can talk your language, understand your problems, know the equipment they sell inside as well as out . . .

Call in and see the amateur radio specialist at your nearest Dick Smith Store. Ask him to show you our range of Yaesu transceivers, linears, power supplies, frequency counters and 'scopes.

You'll find that Dick Smith Electronics can supply most of your amateur radio needs — from a power plug to an antenna insulator, and just about everything in between!

Our service department, one of the biggest and best-equipped in the country, has all the parts, test gear and know-how to service everything we sell.

When you buy Yaesu from Dick Smith, you can be confident you'll never be left in the lurch for service . . .

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**You'll find ours are very competitive.**

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Garry Crapp
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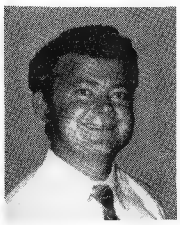
John Dennis
VK2AJF

Bob Thurley
VK4ARY

Allan Greening
VK3WU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COCP

**CQ CQ CQ — CALLING ALL AMATEURS**
**Don't miss out on the all new 1978 edition of Dick Smith's famous catalogue.**
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Peter Harding
VK2NGK

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Yaesu factory prices have just increased by up to 20%. But just look at Dick Smith's prices on Yaesu amateur equipment — some have actually gone DOWN!

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| FT-101E | HF Transceiver | $850.00 | Cat D-2860 | FT-227R | 2m Mobile Transc. | $335.00 | Cat D-2890 |
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| FT-301 | HF Transceiver | $949.00 | Cat D-2870 | YD-844 | Base Microphone | $39.00 | Cat C-1116 |
| FP-301 | Power Supply | $170.00 | Cat D-2872 | FT-301S | HF Transceiver | $710.00 | Cat D-2880 |
| FL-110 | 200W Linear Amp | $210.00 | Cat D-2884 | FT-901D | HF Transceiver | $1275.00 | Cat D-2854 * |
| YO-301 | Monitor Scope | $355.00 | Cat D-2882 | FT-7 | HF Mobile Trans. | $515.00 | Cat D-2866 * |
| YO-100 | Monitor Scope | $330.00 | Cat D-2862 | DC—DC Converter for 901D | | $75.00 | Cat D-2856 * |
| FRG-7 | Comm. Receiver | $350.00 | Cat D-2850 | | | | |

* These items due in approx. 4 weeks.

Dick Smith Electronics is a Yaesu-factory-authorised dealer with full warranty and service back-up.
**How many others can make this claim?**
You may have seen advertisements from 'suppliers' offering similar — maybe even lower — prices, without even having the stock on hand, **nor being able to sell it to you at the advertised price if they do get it.**
Everyone knows this type of advertising is illegal — but the fact is it happens, and happens often.
Dick Smith Electronics has **in excess of $200,000** worth of Yaesu equipment in stock **right now.**

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# WIN A TRIP FOR TWO TO TOKYO
## WITH THE PURCHASE OF ANY YAESU EQUIPMENT

**ENTER OUR SIMPLE COMPETITION — AND WIN A LUXURY TRIP TO TOKYO FLYING QANTAS**

YES! You'll stay at a luxury hotel in Tokyo, and be treated to a guided tour of Akihabara — the amateur's paradise. You'll also be shown through the incredible Yaesu-Musen factory — see where that piece of equipment that helped you to Tokyo came from!
And it's absolutely FREE — all you have to do is write a few well-chosen words and YOU could be the one going to Tokyo.

YAESU

**YOU'LL BE PAMPERED ALL THE WAY BY AUSTRALIA'S AIRLINE TO THE WORLD:**

**QANTAS**

**Competition not valid in states where conditions of entry contravene state laws**

### HERE'S HOW TO ENTER — RULES & CONDITIONS.

Write, in one paragraph of not more than 50 words, the best way that Dick Smith Electronics can promote the fantastic hobby of Amateur Communication to the benefit of Australia.

Obtain an entry form with the purchase of any Yaesu amateur equipment from a Dick Smith store or participating dealer. Complete it in full and post it to
**Amateur Radio Contest PO Box 747. Crows Nest NSW 2065.**

All entries will be judged by Dick Smith to produce 5 finalists. These finalists will be judged by the editor of Electronics Australia magazine to produce a winner. Originality and the constructiveness of the idea will be taken into account.

Entries close at 5PM on 28th July 1978. Entries received after that date will not be considered.

The final judging will take place on 2nd August 1978. The judge's decision will be final and no correspondence will be entered into.

The winner will be notified by mail and by notice in the next available issue of Electronics Australia magazine.

As this flight departs from and returns to Sydney, the winners must travel to and from Sydney at their own expense.

All entries become the absolute property of Dick Smith Electronics Pty Ltd, who may use such entries as they see fit.

# Yes, it certainly pays to buy YAESU from DICK SMITH!

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# Dx COLUMN

*Alan H. Reid, F.I.E.Aust., VK3AHR*
93 Yarrbat Ave., Balwyn, Vic. 3103

**WHAT DX MEANS TO ME**

When asked by the Editor to write something on the above subject for AR, two ready replies sprang to my mind: one was "absolutely nothing" and the other "how heart-warming it is to have friends, people I have grown to know personally, at the other end of the world". It all depends on one's definition of DX!

Is DX the brief long-distance exchange of call signs, reports, names, QTH and "QSL 100 per cent through the Bureau OM 73" sort of thing? Or is it the pleasant, unhurried exchange of personal and technical information between two friendly people situated a long distance apart?

If the term DX refers to the former type of QSO, then I for one find "working DX" a crashing bore. I **know** I can put a signal into his area whenever the band is open, as I have a reasonably good antenna with a couple of hundred watts of clean RF power, and the technique is not that complicated. I suppose if I had a very low-power home-made rig with a poor antenna, I would work DX way but only if I was unable to stir up someone with whom I could talk freely and easily.

Incidentally, I don't want to decry those who enjoy chasing rare countries and adding up the number of countries worked; our hobby has very many facets to it and each of us is entitled to choose which he enjoys most. But this chasing of new countries does not come under my heading of "DX", as a new country popping up on one's doorstep is counted in just as eagerly as an amateur operating from a small rock in mid-Atlantic!

Not only do I find the "hullo and goodbye" type of contact of no interest but they are so often followed up with a card through the Bureau! This despite the fact that I never, or only very rarely, say that I will QSL. I spend quite a lot of my spare time on the air and probably have at least 50 or more stations in my log during any week. It embarrasses me somewhat that I allow most, if not all, of the resulting cards to go unanswered. I much prefer to spend my available time listening or working on the air, followed, in quite a few cases, by an air-mail letter to the amateur concerned. Perhaps I am being selfish in this but I fail to see the value of a QSL card now that world-wide contacts are so easy for us to come by. ■

# DIVISIONAL NOTES

**MODERN CONDENSED VERSION**

## VK2

In the last issue there was a notification that the AGM of the VK2 Division would be held in March. Due to insufficient nominations to form a new Council the AGM will be put back a month while new nominations are called. The new date set for the AGM is 28th April, 1978. The notice and other details are contained in the VK2 Division mini bulletin enclosed in this AR.

The Division is to discontinue the Morse Tape loan service due to declining use. However, the Novice and YRS section of the Division's Education Service has a basic to Novice level of 2 x C60 cassettes and an instruction booklet for $6.50 posted. In addition there is a tape dubbing facility available for various speeds of code. Details from the Divisional Office, 14 Atchison St., Crows Nest 2065.

For many years the Division has conducted the Slow Morse training sessions on the 80 metre band under the call VK2BWI-P. The frequency of 3550 kHz is coming under interference from the increasing use of the Novice portion of this band. Consideration is being given to a frequency change, somewhere round 3535 kHz.

VK2WI — Dural is now providing some of the HF coverage for the morning broadcast (11 a.m. Sunday) with some recently obtained high powered AM transmitters. ■

# INTRUDER WATCH

*Alf Chandler, VK3LC*

**ALL AMATEUR BANDS SLASHED BY HALF**

How would you like to read that caption in "Amateur Radio" late next year? I could happen, you know! The intruders that are so prevalent in our bands are probably there because they do not have sufficient frequencies of their own to operate in. They find that the Amateur bands are so easy to occupy. They don't get hounded off as they do if they get on other frequencies. For instance, say an intruder picked a frequency of the Marine Mobile Service, there would be so many complaints that it would be removed quick smart. Unfortunately, that is not the case with the Amateur Service. There is no avalanche of complaints from amateurs. As a matter of fact, you can count them on one hand. What a sad state of affairs!

As I write this column I am listening to a point-to-point CW transmission on 14251 kHz, the time being 0900Z. The strength of the signal is 9+, and full break-in is being employed, five letter-number code groups with barred letters. I cannot hear the other stations, so I presume it is on another frequency. Two days ago the same signal could be heard on 14204 kHz, but the time was 0230Z. The bearing was 345° ex Melbourne, and I am of the opinion that the transmission originates in Indonesia, but no call sign was given while I was listening. Would members listen at various times for these transmissions? Try to get a call sign or some identification, and you may find it on any segment of the CW portion of the 14 MHz band.

In "Electronics Today" International on page 35 of the February issue is a very interesting and thought provoking article. It is entitled "OTH-B Radar — In Defense of Australia". Perhaps some of the P9 pulse transmissions that have been reported in our bands are not coming from the USSR after all, who knows? However, next time you hear the "woodpecker", get a bearing on it and report your findings to your Divisional IW co-ordinator. Cross bearings may put the location in a very different spot ot where we thought it should be! I have heard a higher pitched pulse in the 14 MHz band. ■

# CONTESTS

*Kevin Phillips, VK3AUQ*
**Box 67, East Melbourne, 3002**

**CONTEST CALENDAR**

**April**

| | |
|---|---|
| 1/2 | Polish "SP" CW Contest |
| 1/2 | Tennessee QSO Party |
| 1/3 | ARCI QRP QSO Contest |
| 8/9 | Swiss "H22" Contest |
| 11/12 | DX YL to NA YL CW Party |
| 15/16 | County Hunters SSB Contest |
| 15/16 | Common Market DX Contest |
| 15/16 | Polish "SP" Phone Contest |
| 22/23 | Bermuda Contest |
| 25/26 | DX YL to NA YL Phone Party |
| 29/30 | Dutch "PACC" Contest |

**May**

| | |
|---|---|
| 6/7 | Vermont QSO Party |
| 13/14 | USSR "CQ-M" Contest |
| 20/21 | Michigan QSO Party |
| 27/28 | Francophones Countries Contest |

**POLISH DX CONTEST**

CW April 1-2, Phone April 15-16. Starts at 1500 GMT on Saturday and finishes 2400 GMT Sunday.

Poland is divided into 49 Provinces (Wojewodztwo). Two letters will be sent by the SP stations to denote their Province. Their are three categories, single operator single and all band, and multioperator all band only; also SWL.

Exchange RS(T) plus a 3 figure QSO number for foreign stations. Polish stations will send RS(T) and their WOJ (i.e. 579KA). Each QSO with an SP/SQ/3Z counts 3 points. Each different Province (WOJ) worked counts as a multiplier and can be claimed once only (max. of 49). Final score is the sum of QSO points multiplied by the number of Provinces worked. The same station may be worked on each band for QSO points, but only once for a WOJ.

Awards are Certificates to the top scorers in each category and mode, in each continent, each country, and each call area of Australia, Canada, USA and USSR.

Use a separate log sheet for each band, and include a summary sheet with the scoring and your name and address in block letters. A signed declaration is requested, and disqualification rules for excessive duplicate contacts, and etc., will be enforced.

Entries must be post marked no later than April 30 for CW and May 11 for Phone. They go to PZK Contest Committee, P.O. Box 320, 00-910 Warszawa, Poland.

**ROSS HULL MEMORIAL CONTEST RESULTS**

| | | 7 day | 48 hour |
|---|---|---|---|
| (a) | Open | | |
| | VK2HZ | 520 | 230 |
| | VK3VF | 254 | 224 |
| (b) | Phone | | |
| | VK2YDY | 1022 | 290 |
| | VK3OT | 4720 | 1671 |
| | VK4DO | 3462 | 1256 |
| | VK4ZRF | 1440 | 542 |
| | VK4ZRQ | 1099 | 399 |
| | VK4ZJP | 939 | 404 |
| | VK4LX | 150 | |
| | VK7ZAH | 360 | |
| | VK8ZGF | 1415 | 755 |
| (c) | CW | | |
| | VK4XA | 370 | 130 |

■

# HAMADS

- Eight lines free to all WIA members. $9 per 3 cm for non-members.
- Copy in typescript please or in block letters to P.O. Box 150, Toorak, Vic. 3142.
- Commercial advertising is excluded. Repeats may be charged at full rates.
- Closing date: 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.
- QTHR means the advertiser's name and address are correct in the current WIA Radio Amateurs Call Book.

**FOR SALE**

**Collins 30S1,** immaculate condition, completely overhauled recently by Collins in Melbourne, new 4CX1000A. Roth Jones VK3BG, 23 Gaudion Road, Doncaster East, Vic. 3109.

**Novice EA 10W AM 80m Tx** (inc. CW xtal), $60; EA 130 Rx 40-80m, $60 or $110 the lot. N. Mattick VK2ZLL, Hill Top, Hargraves, N.S.W. 2850.

**Standard SR-C146A 2m FM 5 Ch. hand held Tcvr** with leather case, AC charger, flex antenna and external mic., mint condition, in original packing, $250. VK3BFB. Ph. (03) 93 1638.

**Icom IC22 2m FM Transceiver,** 40, 50, R2, R4, R5, R6, R7, R8, $150, plus 0-15V, 6A, adjustable power supply, cct. Nov. AR, $50. Adrian Clout VK2BFN, QTHR. Ph. (047) 58 6797.

**AR's, 1960 to 1977,** 50 Practical Electronics, 1965 to 1969, 77 Practical Wireless, 1968 to 1975. Best offers. VK4ZAL, QTHR.

**Yaesu FT75B, FP75B,** AC PS and DC, 75B, DC PS with twelve xtal freq. and instruction book, as new, $450. VK2JD, QTHR. Ph. (02) 639 8020.

**Shack clear-out — recently married!** TR220G, fitted with nicads and ch. 2, 3, 6, 7, 8 and 40. Charger supplied. Also available matching power-booster raising output to 10W. Price $200 ONO; 2m FM Seiwa SV230 25W Tcvr, ch. 2, 4, 6, 8, 40, 50 and 51, slightly modified, price $100 ONO; Pair B70s microwave army tcvr, operating around 3.5 GHz, these complete with AC power supply, $90; Trio 6m tcvr, fitted with crystals operating between 50-52.5 MHz, all valve, output approx. 20W, as this troubled by intermittent fault, would sell for $100. M. Goode VK3BDL. Ph. (03) 61 2701 bus, (03) 99 1806 AH.

**Antenna Noise Bridge Omega Model TE7-02,** up to 300 MHz, with fittings, $40; Hy-Gain 204BA 4 el. 14 MHz yagi with Hy-Gain BN-86 balun and 100 ft. RG8U antenna cable, $225; Surveyor 23 ch. AM CB radio, $40; new U.S. manuf. 12V DC bi-linear amplifier 3-29.5 MHz, 8-20W drive for 160W PEP output, using pair Motorola MRF453 power transistors, very well made, $200. VK2JO, QTHR. Ph. (02) 36 2981.

**Tx HF 80-10m** SSB, AM CW, with PS and circuit, made from ARRL, $50; 20m mark mobile helical whip, $15. VK3ZRO. Ph. (03) 99 3333.

**Hallicrafters SX101** Rx, VGC, $210; HB 7 MHz Rx with PSU, $15. VK3AWD, QTHR. Ph. (03) 338 8574 AH.

**Various Breadboard Vintage Wireless Component Parts,** 1925-30 era, assorted B/C coils — variable condensers, dials, rheostats, variocouplers and meters, also WWII and earlier valves. Sale or Swap. SAE for list. A. Shawsmith, 35 Whynot St., West End. Qld 4101. Ph. (07) 44 6526.

**Xtals Ken KP202 and Tone Burst,** 4 UK and European repeaters, 1 Simplex Ch., handy over there. Cheap. VK2BDT, QTHR. Ph. (048) 21 5036.

**Yaesu FT101B,** excellent condition, $550. VK5DL, QTHR. Ph. (08) 79 7901 (bus.) and ask for Tony Dexter.

**Yaesu FTDX401 Tcvr,** 560W PEP input, in immaculate condition throughout, complete with manual, $425.00. Belcom Liner 2m SSB rig, 12W PEP out, noise blanker, etc., in excellent condition, $160.00. Ray Price VK3AWQ, QTHR. Ph. (056) 74 1351.

**Kenwood TS820** with digital readout, 12 months old, in mint condition, little used, $950. VK3ARD, QTHR. Ph. (03) 277 3954.

**A Complete Morse Package,** comprises two C60 cassettes, exercises and tests with a programmed learning manual, $6.50 posted. N.S.W. WIA Education Service, VK2ZCA, C/- P.O. Box 109, Toongabbie, 2146.

**Europa B 2m Transverter,** all modes — 180W input, 28 MHz, IF, $180 ONO. Trio 7200G, 2m FM rig, R2, R8, Ch. 40, Ch. 50 plus another dozen assorted xtls, plus 50W amplifier, $180. VK7CCC, QTHR.

**Telequipment D61 Oscilloscope,** 10 MHz, 10 mV, dual trace, with 2 x 1 probes and handbook, $325. Vic McDonald VK3ADQ, QTHR. Ph. (03) 850 6859.

**ZL Repeater xtals,** complete set chans. A, B, C, D for Ken KP202 hand-held FM transceiver, $40. Jim Preston VK6JP, QTHR. Ph. (09) 364 1779.

**Self-Supporting Tower** — Crank down tilt over, puts beam at 58' or on ground — no guys, double geared winch, take highest winds, $850. VK6HP, QTHR. Ph. (092) 450 4379.

**AWA MR6 2m Carphone,** Ch. 2 and 8 rpt. Ch. 40, old Ch. A, working, $50. 2 PA amplifiers, 60W and 30W, $25.00 each. Osker Bloc SWR meter, $50.00. S. Castle, 6 Gray Place, Kings Langley, NSW 2147 or on Sydney 2 metres VK2ZSC.

**Signal Generator,** No. 15, Marconi, Model TF801A, 10 MHz-300 MHz, 4 switched ranges, 0-99 dB attenuator, internal, external, modulation (sine or square or pulse), $140.00. Doug Johnson VK3YMG, 25 Verney Road, Shepparton, 3630. Ph. (058) 21 2309.

**Uniden 2020 SSB Transceiver,** first class condx., unused, with manual and servicing notes, $700 ONO. Hy-Gain all band vertical antenna, 18 AVT, with tuning and application notes, $100 ONO. Type 15 Teletype WGK, $50 ONO. VK2ZQH. Ph. (02) 498 7867 AH, (02) 270 4593 bus.

**6m National Tcvr,** portable AM/FM, battery or external P/S, 1 or 3W output, VFO control, tuneable 50-54 MHz, $195.00. Ken hand-held 2m Tcvr, complete, $150.00. Realistic AX190 communic. Rx in box, $190.00. Would swap any single item for solid state 2m car transceiver of equivalent value. VK3ZPV, 122 Mary Ave., Wheelers Hill. Ph. (03) 561 4885.

**Estate Late** VK2TA. FT2 Auto, $150. HT32, $100. SX115, $300. SR150 C/W mains and DC supplies, $300. Hammarlund HY500 Tx, $200. HQ170 Rx, $200. AVO meter EA113, $125. BC221 Freq. Meter, $45. Funke Valve Tester, $30. Drake Wattmeter, $20. Dynamic transistor tester, $20. Contact Pat Ashby, Ph. (02) 57 5033.

**Toroids** as on P.581 of 1977 ARRL handbook, take legal power 3-30 MHz, $7.55 ea. plus p&p 40c for one, 60c for two. Geoff Forrest VK3AGF, QTHR. Ph. (03) 379 6524.

**Vintage Radio Books:** Elementary Principles of Radio/Telegraphy, pub. 1917, parts 1 and 2; How to Conduct a Radio Club, pub. 1917; Practical Amateur Wireless Stations, pub. 1920; ARRL Handbooks 1929 & 1936, also other handbooks; QST from 1927 to 1971. All in good condition. Offers to Geoff Vaughan, VK2FY. Ph. (02) 602 9043 (ex. VK2ZYC, QTHR).

**Antenna Tuners,** 160-10m, one only each SST, T1 random wire tuner 4¼" x 2 3/8" x 3" at $39.95 plus p&p 60c and T2 for any coax fed antenna or random wire 5¼" x 2¼" x 2½" at $64.95 plus p&p 60c. Both brand new, manfs. samples, both handle 200W output. As advertised in Ham Radio, QST, etc. Geoff Forrest VK3AGF, QTHR. Ph. (03) 379 6524.

**Computer Power Supplies:** 2 units only, both working. Silicon technology unit, +20V at 4.5A, +10V at 5A, —10V at 5A, —20V at 1.6A, $50 ONO. Germanium Beast, +30V at 1.5A, +12V at 1A, +10V at 1A, +8V at 1A, +4V at 0.5A, —8V at 1A, —11V at 0.25A, —30V at 1.5A and —90V, $25 ONO. Kris McLean VK2AJS. Pr. (02) 604 4137.

**FT620 6m SSB/AM Transceiver,** plus homebrew 146 linear/FET preamp. and associated AC PSU, $365 the lot. Also transformer for Scope soldering irons, 30A at 3.3V intermittent rating, $7. Alan Woods VK3ZMN, QTHR. Ph. (03) 544 9955, ext. 34.

**Digital Readout for FT101,** PC boards (see article January 1978 AR), now available from the author. 2 boards tin plated and drilled, single sided, $18, including detailed layout etc. and postage. Keith Gooley VK2BGZ, QTHR. Ph. (02) 61 6791 bus, (02) 908 2754 AH.

**Transverter,** 11m to 80m, will cover full 80m band on 23 channel CB set, $60 ONO. Richard Cowles VK2ANB. Ph. (02) 699 9403 AH.

**Galaxy 5 Transceiver,** 80-10m, good order, with P/S, manual, circuit, suit novice, less mic. ant. relay wants attention (it's not burnt out), $200. Vinten MTR13, 6 chs.: 2, 3, 4, 7, 8, 40, very clean, also MTR12, Ch. 52-524, very clean. Any reasonable offer, will separate. Steel wind-up tower, goes 75 feet, want a little attention, $65. VK3FO, QTHR. Ph. (054) 75 2378.

**Kenwood TS820S,** digital readout, with mic., little used, mint condition, in original carton, $925. VK3ACN, QTHR. Ph. (054) 42 1288 bus.

**FT101 Transceiver,** as new, with CW filter, 160 and 11m, fan, spare Rx front end, $550. VK1VP, QTHR.

## WANTED

**Collins Filter for 75S3B 500 to 750 Hz.** Roth Jones VK3BG, 23 Gaudion Rd., Doncaster East 3109.

**Trio 9R59DS Rx,** reasonable condition, preferably going. N. Mattick, Hill Top, Hargraves, N.S.W. 2850.

**Transceiver HF SSB,** working or otherwise, for blind amateur. C/- VK2JO. Ph. (02) 36 2981.

**FV400 Ext. VFO for FTDX400 frequency meter,** AC supply pref., ch. 7 xtals for MR6, Vibroplex or similar key. VK3LP, QTHR.

**FL400 Yaesu Tx,** details and price to P. Squire VK2NMG, Box 5, Quirindi, N.S.W. 2343.

**Communications Rx,** valve type o.k., accuracy to within 5 kHz, HF band, under $100. R. Silcock VK4NBC, QTHR. Ph. (074) 62 1294.

**Padder Condenser** for 3-6 MHz command Rx. Would consider going, butchered or cannibalized set. Also up to 2 24 gene motors for same. John Mackie VK2ZDM, Hillston. Ph. 069 6711 and ask for me.

**B-60 Microwave link.** Doug Johnson VK3YMG, 25 Verney Road, Shepparton, 3630. Ph. (058) 21 2309.

**HF Transceiver FT200** etc., under $400 or will swap SX101 Rx with cash adjustment. VK3AWD, QTHR. Ph. (03) 338 8574 AH.

**Collins 75S-3C Rx, Collins 32S-3A Tx,** 516F2 AC power supply, Collins KWM-2, 2A transceiver, must be mint condition, preferably round emblem, reasonably priced. VK2JO. Ph (02) 36 7756.

**Radio and Hobbies Magazines,** pre-1960, 69 copies required to complete my collection and enable them to be bound into volumes. Jim VK3ZKK. Ph. (03) 870 1745.

**Replacement Tube for Telequipment Type D52 CRO.** T. Harkness, 38 Dunblane Road, Noble Park. Ph. (03) 546 9176.

# SILENT KEYS

**It is with deep regret that we record the passing of —**

| | |
|---|---|
| Mr. A. E. BRUCE | VK5NLS |
| Mr. A. D. PRIDGEON | VK3ZCP |
| Mr. K. J. WILLIAMS | VK2XD |
| Mr. W. H. SORENSEN | L40669 |
| Mr. DUDLEY McDONALD | VK4MY |
| Mr. ALAN J. SUTHERLAND | VK4AKY |
| Mr. A. J. SUTHERLAND | VK4AKY |

**"NED" WHITE VK2HA**

**The passing of Flt Lieut. Elwyn, Boyce ("Ned") White M.B.E., owner-operator of amateur radio VK2HA, at hospital on the 30th January last not only leaves a "silent key" but adds a glowing new tribute to Amateur Radio in both peace and war.**

**"Ned", as he was generally known on the air, had a nick-name which he earned during the Middle East conflict and which stuck to him all through the war. The nick-name was "Clifty" which is an Arabic title well known among every member of the Middle East Forces, and referred to "Ned's" uncanny ability to unearth the whereabouts of carefully hidden enemy stores of radio parts, valves etc.**

**To his family and friends, we extend our deepest condolences.**

**From Frank Carey VK2AMI**

**DUDLEY McDONALD VK4MY**

**"Dud", who just missed his 70th birthday, was well known in the early days of broadcasting, working at 3LO and 3AR, Melbourne.**

**He decided to take up amateur radio as we know it about 1932 as VK3DM. With this call sign and VK4MY since 1964, Dud filled his shack walls with almost every certificate that became available to DXers and old-timers.**

**His main operations were CW, which he enjoyed working to all, every night up to his final day.**

**Our sympathy to his wife and her sister.**

**Peter H. Brown VK4PJ,**
**Hon. Secretary Qld. Division.**

**WWII Communications Receivers** and any Spark or pre-war II gear and parts, morse keys, and sockets for 813 valves, cables or plugs for AWA No. 11 set. Write A. Shawsmith, 35 Whynot Street, West End, Brisbane, Qld. 4101, or ph. (07) 44 [illegible]

**SSB HF Transceiver** or separates wanted, 10-[illegible], preferably Collins, Drake, Heath, Galaxy, Hallicrafters. KV2JO, GPO Box 5076, Sydney, N.S.W. 2001. Ph. (02) 36 7756.

**Beginners in Electronics** — sample the famous NSW YRS texts — Elementary I or II Theory Notes ($1.00 posted); or the new 50 Projects Text ($1.50 posted). VK2ZCA, Services Officer, C/- PO Box 109, Toongabbie, 2146.

**Collins KWM-2A Transceiver,** 516F-2 power supply, 312B-5 VFO, mint condition only, Melbourne replies only. VK3BR, QTHR.

**Transmitter, old fashioned,** like KWS-1, CE-200V or similar. Price and condition to VK1VP, QTHR.

## TUITION

**Novices** — study for your full AOCP licence using the "B course study guide". In 15 sections, it takes you through the topics with self-testing questions. Used along with either ARRL or Radio Handbook by Orr you can convert to full or limited AOCP. Don't miss out!! Reasonably priced at $4.00, postage paid. Orders to: Ann Davis VK4AYL, P.O. Box 200, Alderley, 4051.

**Morse Code** — The now famous "Sound Only Method" of learning the morse code has been further upgraded. New edition of cassette lesson now on C90. The notes "Learning the Morse Code for Amateur Radio Purposes" now published in book form — 60 cents. The new C90 lesson and booklet $4.50, plus 60 cents postage, from Roger Davis VK4AAR, P.O. Box 200, Alderley, 4051.

# ARE YOU A FRUSTRATED KNOB TWIDDLER ?

Price $279

**ICOM IC-22S FM transceiver**

## It's Crystal Clear

The IC22S comes complete with mic, mobile bracket and manual plus VICOM 90 day warranty. Ask yourself the question. Why IS the IC22S the best choice?

Many other synthesised digital readout rigs are excellent for fixed portable or base station operation — as a mobile unit they fall down on several counts.

1. Difficult to tune when driving
2. Difficult to see readout when driving
3. Difficulty in memorising frequencies when selecting a repeater or simplex.

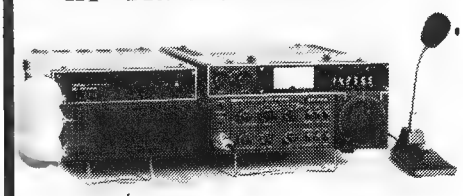
Image (when belting along at 100Km/hr) the following scenario:

1. VK3XXX says "QSY repeater 7".
2. You say — "er, roger". (think R7, is it 146.95 or 146.75 receive — how many clicks from where I am to whatever I think it is — do I have to press the 5KHz button?)
3. "Oh!. QRX one"! (Sorry officer, I didn't see him as I was tuning my radio!!)

So-o-oo . . . that leaves you with the IC22S:

* easy channel selection — you know where they are, and you can arrange channels exactly where you need them.
* Diodes replace crystals.
* Reverse repeater at a flick of a switch.
* Add a scanner.

***ICOM'S DIGITAL ALL SOLID STATE***
## *HF TRANSCEIVER*



**IC701**

* All Solid State, even the finals
* 100W Continuous Duty on All Bands, All Modes
* All Bands 1.8 ~ 30MHz
* USB, LSB CW, CW N(Narrow), RTTY
* Double Balanced Schottky Diode Mixer used in both receive/transmit
* Dual built-in individual Digital VFO's offer split frequency operation
* ICOM's unique Pass Band Tune
* VOX, Semi break in CW, RIT, AGC, Noise Blanker
* Built-in Speech Processor
* Full Metering
* Extremely compact
* Digital readout and all filters built in
* Built in DC power supply
* Optional AC power supply speaker
* Full line of accessories to come

ICOM

**IC701 TRANSCEIVER $1160**
**IC701PS optional AC supply $239**

## MICROPHONES

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| VM-1 ptt lowZ, noise cancelling | $8.90 |
| VM-2 base with preamp, low Z | $29.80 |

## Antennas!

*You know you can count on*

**hy-gain**

| | |
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| **Hy-Quad** 2el 10/15/20m | $ 299 |
| **TH3Jr** tribander, 3el | $ 199 |
| **TH3MK3** 3el, 10/15/20 | $ 269 |
| **18AVT/WB** 80-10m trap vertical | $ 139 |
| **14AVQ/WB** 40-10m trap vertical | $ 99 |
| **TH6DXX** Thunderbird 6el tribander | $ 345 |
| **204BA** 4el 20m monobander | $ 249 |
| **203BA** 3el 20m monobander | $ 190 |

## TWO METRES

| | |
|---|---|
| ARX-2 Ringo Ranger base antenna | $49 |
| **AS210BN** twin 10el 2m beam | $ 119 |
| 42S ¼ wave mobile whip with cable | $14 |
| 82D wave mobile whip with cable | $26 |

## TRAP VERTICALS

| | |
|---|---|
| **V5Jr** 6.7m high, 80-10m, no guys | $ 129 |
| **V4Jr** 4.25m high, 40-10m, no guys | $ 95 |

## TRAP DIPOLES

| | |
|---|---|
| **Midy VNB** 80 thru 10m, 23m long. | $ 99 |
| **AL48DXN** 40/80m, 2Kw pep max. | $ 59 |

**Warning:** The law requires that a licence be held for all transmitting equipment. Purchasers may be asked to provide evidence that he/she is the holder of an appropriate certificate of proficiency. Prices and specifications are subject to change without notice.

## ALL-MODE for TWO NOW $750

**ICOM IC211 2m fm transceiver**
The new IC211 from **VICOM** is the last word in digital 2m, all-mode transceivers. Fully synthesised in 100Hz or 5KHz steps, has dual tracking, optically coupled VFOs with 7 digit LED readout. One knob controls all frequencies. Modes fm, usb, lsb, cw. Internal 240vac and 13.8vdc power supply. Comes complete with VICOM 90 day warranty

ICOM

| | |
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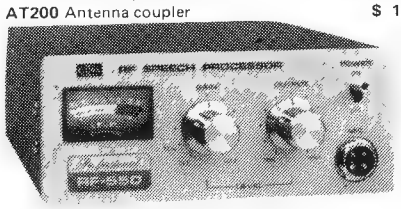
| **IC202E** 2m ssb portable transceiver | $ 219 |
| **IC502** 6m ssb portable transceiver | $ 219 |
| **IC245** 2m fm digital mobile transceiver | $ 450 |
| **IC215** 2m fm portable with 9 chs. installed | $ 219 |

YAESU

| | |
|---|---|
| **FT101E** HF transceiver | $ 849 |
| **FT7** HF mobile solid state | $ 569 |
| **FL2100B** HF linear amplifier | $ 578 |

KENWOOD

| | |
|---|---|
| **TS820S** HF digital transceiver | $1105 |
| **TS520S** HF digital transceiver | $ 705 |
| **VFO820S** vfo for TS820S | $ 155 |
| **TV502** 2m transverter | $ 260 |
| **TV506** 6m transverter | $ 229 |
| **MC50** high Z desk mic. | $ 55 |
| **MC10** high Z hand ptt mic. | $ 15 |
| **TL922** linear amplifier 2Kw input | $1045 |
| **AT200** Antenna coupler | $ 159 |



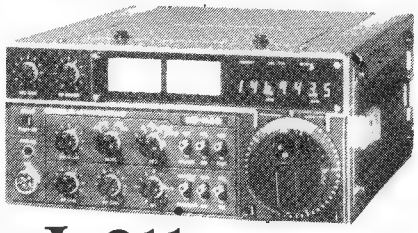
**DAIWA RF SPEECH PROCESSORS**
Daiwa have introduced a new range of RF speech processors which are simply attached into the microphone line. Two new modes are available, mode **RF440** which features a phase shift network and mode **RF550** which utilises a crystal filter. The processors are a suitable alternative to a linear amplifier — up to 6dB gain (4 times) improvement on the signal can be expected! Both models feature 240vac/13.9vdc operation and include compression level monitoring via a front panel meter. Impedance is switchable 50K/600ohms with distortion better than 3%

| | |
|---|---|
| Model RF440 (phase shift) | $119 |
| Model RF550 (crystal Filter) | $159 |
| Model MC330 (audio compressor) | $71 |

## MORSE KEYS

| | |
|---|---|
| **HK702** deluxe key with marble base | $ 35 |
| **HK708** economy key | $ 19 |
| **HK706** operators key | $ 20 |
| **MK701** manipulator | $ 29 |
| **EK103W** electronic keyer | $ 159 |

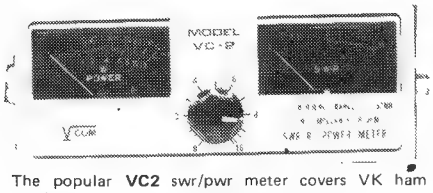
## STATE OF THE ART



## Ic211

## QUALITY SWR BRIDGES

**OSKERBLOCK SWR200** 3.5 thru 200MHz, 2/20/200/2000w pwr — $ 75



The popular **VC2** swr/pwr meter covers VK ham bands plus CB. Each unit fully calibrated for high accuracy with power measurements 12/120w. Complete with informative instructions. Price **$34.**

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|---|---|
| **SW410A** 140 thru 500 MHz, 20/120w, direct reading — no freq. adjustment required | $ 99 |
| **SW210A** 1.8 thru 150MHz 20/200w, direct reading | $ 79 |

## LOW PASS FILTERS

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| **FD30M** 32MHz cut-off, 1Kw max. | $ 30 |
| **FD30LS** 32MHz cut-off, 200w pep max. | $ 20 |

## ROTATORS

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| **ART8000** super heavy duty | $ 478 |
| **ART3000C** heavy duty with control box | $ 199 |
| **AR22XL** light duty, OK for small beams | $ 109 |

## FOR THE SWL

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|---|---|
| Yaesu **FRG7** receiver | $ 349 |
| **Barlow Wadley** portable with fm | $ 339 |
| **UP-3** receiver preamplifier | $ 35 |
| Listener-3 **antenna** for short wave | $ 49 |
| **NRD505** professional receiver | $2499 |

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**AUBURN VIC 3123**

**PH 03-82 5398**

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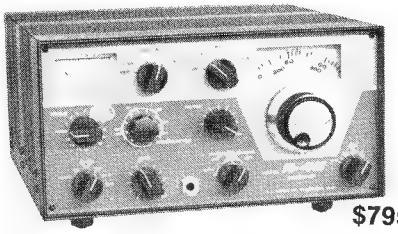
| Adelaide | 43.7981 | Brisbane | 38.4480 |
| Gold Coast | 32.2644 | Hobart | 43.6337 |

# DRAKE® C-Line Amateur Equipment



$795

## Drake R-4C

Solid State Linear permeability-tuned VFO with 1 kHz dial divisions. Gear driven dual circular dials. High mechanical, electrical and temperature stability.

Covers ham bands with crystals furnished. Covers all of 80, 40, 20 and 15 meters, and 28.5-29.0 MHz of 10 meters.

Covers 160 meters with accessory crystal. In addition to the ham bands, tunes any fifteen 500 kHz ranges between 1.5 and 30 MHz, 5.0 to 6.0 MHz not recommended. Can be used for MARS, WWV, CB, Marine and Shortwave broadcasts.

Superior selectivity: 2.4 kHz 8-pole filter provided in ssb positions. 8.0 kHz, 6 pole selectivity for a-m. Optional 8-pole filters of .25, .5, 1.5 and 6.0 kHz bandwidths available.

Tunable notch filter attenuates carriers within passband.

Smooth and precise passband tuning.

Transceive capability; may be used to transceive with the T-4X, T-4XB or T-4XC Transmitters. Illuminated dial shows which PTO is in use.

Usb, lsb, a-m and cw on all bands.

Agc with fast attack and two release times for ssb and a-m or fast release for break-in cw. Agc also may be switched off.

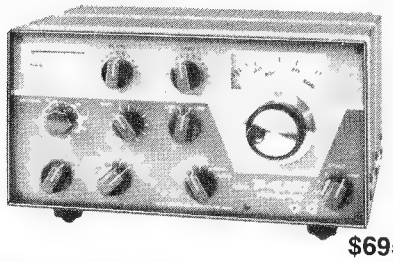
New high efficiency accessory noise blanker that operates in all modes.

Crystal lattice filter in first i-f prevents cross-modulation and desensitization due to strong adjacent channel signals.

Excellent overload and intermodulation characteristics.

25 kHz Calibrator permits working closer to band edges and segments.

Scratch resistant epoxy paint finish.



$695

## Drake T-4XC

Solid State Linear permeability-tuned VFO with 1 kHz dial divisions. Gear driven dual circular dials. High mechanical, electrical and temperature stability.

Covers ham bands with crystals furnished. Covers all of 80, 40, 20 and 15 meters, and 28.5-29.0 MHz of 10 meters.

Covers 160 meters with accessory crystal. Four 500 kHz ranges in addition to the ham bands plus one fixed-frequency range can be switch-selected from the front panel.

Two 8-pole crystal lattice filters for sideband selection.

Transceives with the R-4, R-4A, R-4B, R-4C and SPR-4 Receivers. Switch on the T-4XC selects frequency control by receiver or transmitter PTO or independently. Illuminated dial shows which PTO is in use.

Usb, lsb, a-m and cw on all bands.

Controlled-carrier modulation for a-m is compatible with ssb linear amplifiers.

Automatic transmit-receive switching. Separate VOX time-delay adjustments for phone and cw. VOX gain is independent of microphone gain.

Choice of VOX or PTT. VOX can be disabled by front panel switch.

Adjustable pi network output.

Transmitting agc prevents flat-topping.

Meter reads relative output or plate current with switch on load control.

Built-in cw sidetone.

Spotting function for easy zero-beating.

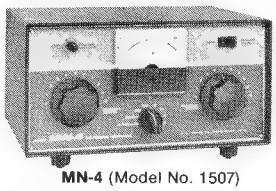
Easily adaptable to RTTY, either fsk or afsk.

Compact size; rugged construction. Scratch resistant epoxy paint finish.

$47

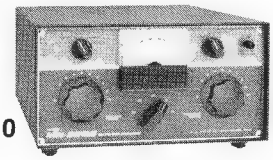
## Drake MS-4

**Drake MS-4 Matching Speaker** for use with R-4, R-4A, R-4B and R-4C Receivers. (Has space to house AC-3 and AC-4 Power Supplies)



$165

**MN-4** (Model No. 1507)



$310

**MN-2000** (Model No. 1509)

## Drake MN-4 & MN-2000 Matching Networks

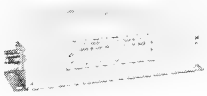
• **Integral Wattmeter** reads forward power in watts and VSWR directly, can be calibrated to read reflected power • **Matches 50 ohm transmitter output** to coax antenna feedline with VSWR of at least 5:1 • **Covers ham bands** 80 thru 10 meters • **Switches in or out** with front panel switch • **Size:** 5½"H, 10¾"W, 8"D (14.0 x 27.3 x 20.3 cm), MN-2000, 14⅜"D (36.5 cm).
• **Continuous Duty Output:** MN-4, 200 watts; MN-2000, 1000 watts (2000 watts PEP) • **MN-2000 only:** Up to 3 antenna connectors selected by front panel switch.

## TVI Filters

### Low Pass Filters for Transmitters

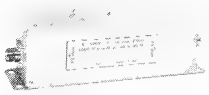
have four pi sections for sharp cut off below channel 2, and to attenuate transmitter harmonics falling in any TV channel and fm band. 52 ohm. SO-239 connectors built in.

**Drake TV-3300-LP**



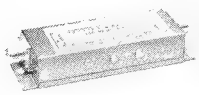
1000 watts max. below 30 MHz. Attenuation better than 80 dB above 41 MHz. Helps TV i-f interference, as well as TV front-end problems. **$32**

**Drake TV-5200-LP**



200 watts to 52 MHz. Ideal for six meters. For operation below six meters, use TV-3300-LP or TV-42-LP. **$32**

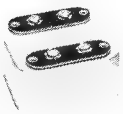
**Drake TV-42-LP**



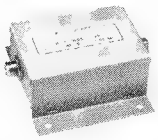
is a four section filter designed with 43.2 MHz cut-off and extremely high attenuation in all TV channels for transmitters operating at 30 MHz and lower. Rated 100 watts input **$19**

### High Pass Filters for TV Sets

provide more than 40 dB attenuation at 52 MHz and lower. Protect the TV set from amateur transmitters 6-160 meters.



**Drake TV-300-HP**
For 300 ohm twin lead **$13**



**Drake TV-75-HP**
For 75 ohm TV coaxial cable; TV type connectors installed **$17**

Prices shown include Tax

Write, 'phone or call for technical information.

**ELMEASCO**

***Instruments Pty. Ltd.***

P.O. Box 30, Concord, N.S.W. 2137.
Telephone: 736-2888.
Melbourne: P.O. Box 107, Mt. Waverley, Vic. 3149.
Telephone: 233-4044.
Adelaide: 42-6666; Brisbane: 392 2884.
Perth: 25-3144.

# The Bulletin

APRIL 1978

W.A. SUPPLEMENT TO "AMATEUR RADIO"

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11. VK6CW - referance W.I.C.E.N. Nets and enclosures (letters supporting VK6DD Percy Beacher)
12. Albatros Radio Club (Qld) - Summary of Club aims
13. Transport Amateur Radio Group - Repeater proposed
14. Nominations for Council 1978 - VK6NK - VK6DA

W.I.C.E.N REPORT AND PLAN

The WICEN Report was discussed in detail and general comments were favourable.

Moved VK6IF seconded by VK6IW " That the WICEN document 1/78 be accepted by the Council as the guiding document for WICEN operators."

The question as to whether the WICEN Group could run a training exercise to coincide with the Scout "Swantiki" was raised and permission of the P & T to be sought.

BROADCAST OFFICER

The Duty Operator reported that the Broadcasts were going smoothly and that 7 or 8 Interstate reports were being recieved each week.

BULLETIN EDITORS

Adequate information on hand for this month.

PROGRAM ORGANISER

Requested suitable questions for use at the March Quiz Night.

W.A. CONTESTS AND 15oth YEAR CONTEST

These to be discussed in detail next month

PUBLIC RELATIONS OFFICER

Reported some progress with organisation and arrangements for W.A. Week.

Nothing further has been done regarding the Bumper Stickers and there appears to be some questions as to whether the slogan selected is suitable.

TREASURURS REPORT

The Annual Financial Report has been completed and ready for publication.

The following accounts were presented for payment

| | |
|---|---|
| R & I Bank | 193.49 |
| Annual Subs to Amateur Radio | 16.46 |
| Schosonic Sound - 20 Cassettes | 43.93 |
| Vanguard Insurance - Public Liability Personal Accident | 65.62 |
| VK6NK - 300 Shire Maps | 18.74 |
| VK6AN - Bulletin postage and costs | 28,74 |
| D. Simpson - VK6WG Wall Plaque | 20.00 |

Moved VK6NE seconded VK6TU "that tapes purchased on behalf of VK6YL for production of an Amateur Radio Course be authorised to a total of 30 tapes." Carried

RECEIPTS

| | |
|---|---|
| Subscriptions - Federal Ex. | 1637.34 |
| Feb Meeting Book Sales | 295.00 |
| Zone 29 Award | 1.00 |
| VK6PG "Ringo" Antenna | 40.00 |

MEMBERSHIP SECRETARY

Letter recieved from VK6AV. - Membership Secretary to write

Pensioner Membership

R.T.T.Y. LIASON

It was reported that 19 were present at the meeting inc;uding Barry VK6BR.

REPEATER GROUP

Channel 4 Repeater is temporaly situated at Lesmurdie.

EQUIPMENT OFFICERS

John VK6ZJF reported that he would be unable to attend meetings for a while. He returned to the Treasurer money held for change for Equipment Sales.

PETTY CASH ADVANCES

Moved VK6TU seconded by VK6NK "that advances of money to various members be repaid on or before December 31st of each year so as to clear the accounts." Carried

GENERAL BUSINESS

Moved VK6NK seconded VK6IW "that representatives from country areas be appointed as per current constitution and that they be invited to attend an Annual Seminar to discuss general and local items and problems with a travelling subsidy payable if requested." Carried

VK6CU advised that the Repeater Group had some agenda items for the Federal Convention being prepared.

VK6IW enquired regarding the printing of the Constitution.

VK6TU advised that Chris Dodd was being abused by members because of lack of Publications. After some discussion it was moved VK6AN seconded VK6ZJF "that all future postage of books be at surface rates and if Air Mail is required the balance to be paid by the member in advance." Carried.

VK6IF advised that it may be possible to mount an Amateur Radio Display in co-operation with TVW-7 at Langley Park during W.A.Week.

VK6ZJF enquired about Identification Cards for WICEN members-nothing being done at the moment.

VK6ZIH reported that the AOCP exam had been held that day and that it was quite a fair exam.

VK6NE read a letter from VK6UU regarding Repeaters. This letter was further explained by Adrian VK6CU.

After some discussion it was moved VK6ZJF seconded by VK6DY " that the sum of $100 be donated to the Kalgoolie Repeater Group to assist it in updateing its equipment." Carried

Meeting closed at 2305.

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SCOUT RADIO SEMINAR AT MANJEDAL

This Training Seminar organised by the W.A. Branch of the Scout Association Radio Communications Sub Committee was for members of the movement who had an interest in the subject and had shown some profiency in operation and other aspects of Amateur Radio and Communications.

A total of 31 Scouts and Guides attended and during the long weekend covered a wide and varied range of subjects including FSTV, RTTY, HF Communications, VHF Communications, Public Address type broadcasting, Antenna theory, Regulations and C.W. practice.

The CW was put in just as an added interest but it proved one of the most popular activities of the entire weekend. There always appeared to be someone in the CW shack "pounding brass". Several members became quite proficient with the key and we hope that there will be some CW operators about for JOTA in October.

The Seminar was attended by the W.A. Branch Organiser for Jamboree 1979 and explained to the members some of the problems entailed in the organising of such a large function. The budget alone for this Jamboree is in excess of $1,000,000 .

Quite a lot was learnt by the organisers on several of the subjects related to the forthcomming Jamboree and this will enable them to iron out a few of the problems before the eventuate.

The sincere thanks of all members of the Scout Association and the Guide Association for the great assistance given by so many Amateurs during this weekend. Some loaned equipment, some gave their time and energy and many just were willing to work the statons operating form Manjedal and talk to the Scouts and Guides. These were just as important as any of the others because without them it would have been a dull show.

Special thanks to the operators from Paraburdoo Scouts who had a terrific contact on the Sunday morning .

Also very special thanks to non-scout members Gill VK6YL and Ross VK6DA for the magnificent job that they did over the weekend and the way that they put up with all those questions that were being continually thrust at them. Truly appreciated by all members of both Movements.

A further Seminar will be held in July and we hope and trust that we will get the same response as before.

Scout Association of Australia
W.A. Branch
Radio Communications Sub-committee
VK6HU Peter Hughes
VK6AN Les Ball
VK6KB Bill Knubley
VK6NK Cliff Waterman

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